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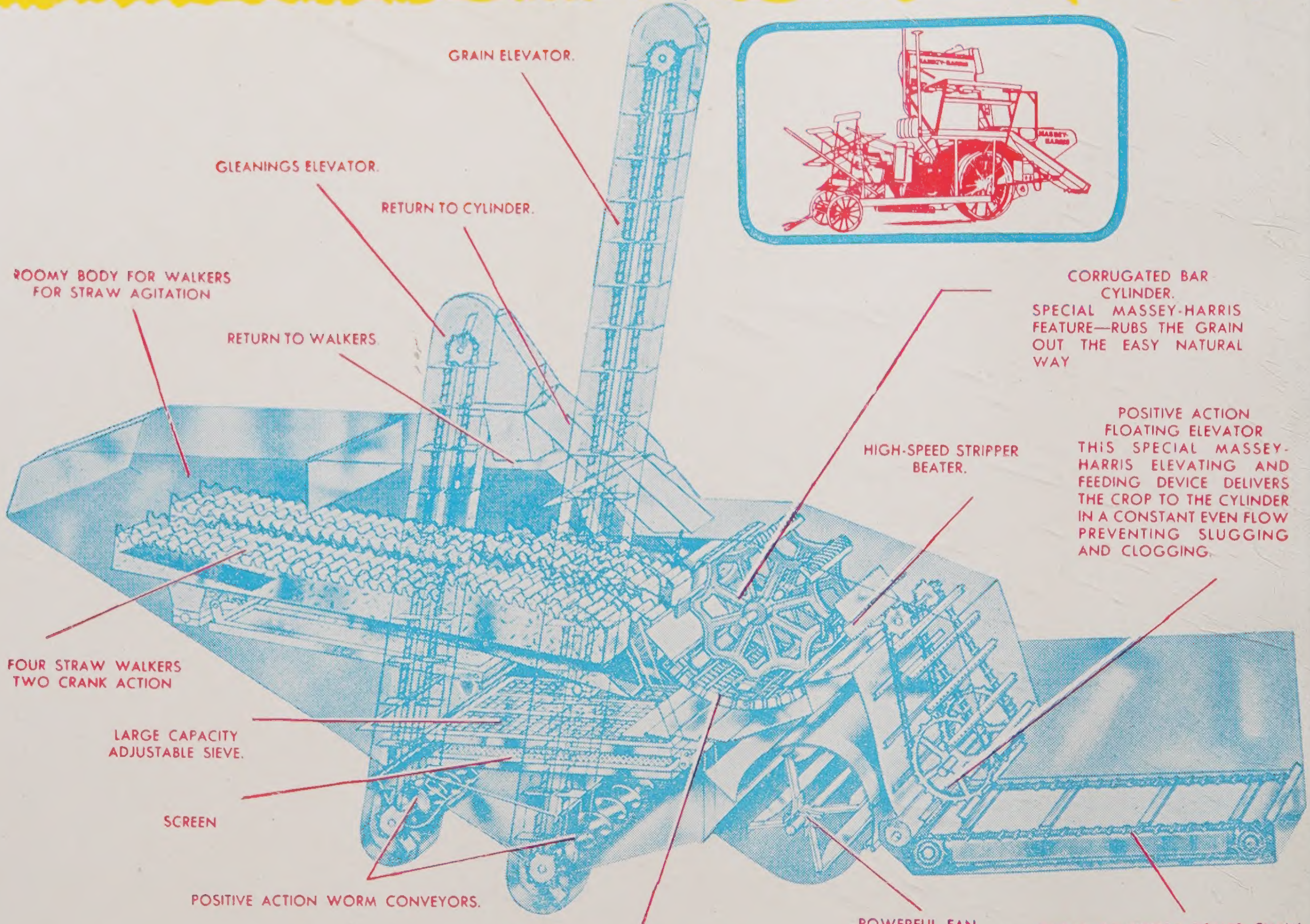
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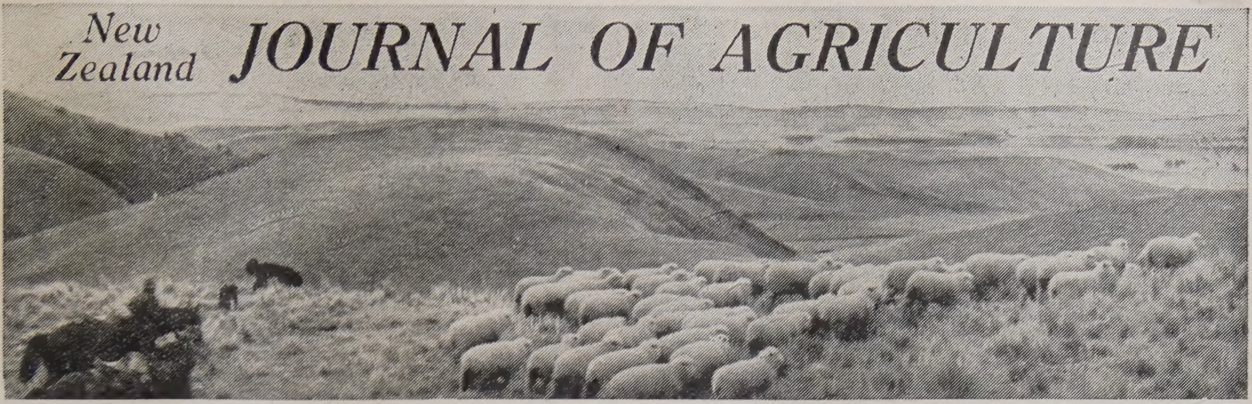


Vol. 71, No. 6. Published by Direction of Hon. B. Roberts, Minister of Agriculture. December 15, 1945.

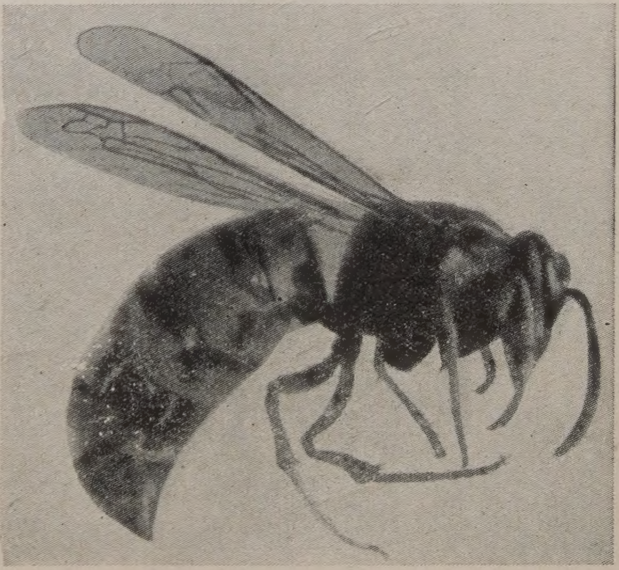
Wasps in New Zealand

WHILE the wasps reported from the Waikato last year are of the common sorts and are more of a nuisance than a pest, it would be desirable to eradicate them, if possible, while the infestation is more or less localised. Success in their destruction can be achieved only with the co-operation of the public, and the information in this article by the Horticulture Division should be sufficient to enable the wasps and their nests to be identified and destroyed or their presence reported to the Apiary Instructor for the district.

IT is not generally known that there are a large number of varieties of wasps, including solitary and social varieties, all of which belong to the *Hymenoptera* order of insects. Certain social wasps build their nests in trees and bushes, others chiefly in the ground, but occasionally in sheltered places such as the walls of a wooden building. At least two varieties of the social group, *Vespa vulgaris* and *Vespa germanica*, have become established in New Zealand. The former species was located in the Wairarapa some time prior to 1916, and the latter was reported to be on the increase in the Waikato last year.

Life History

Young queen wasps of the common sorts, *Vespa germanica* and *Vespa vulgaris*, are raised in the autumn, and after mating they hibernate singly in some dark sheltered corner. With the exception of the newly-emerged young queens, all the community, including the old queen, die off in the autumn. In the spring the young queen awakens and immediately hunts for some suitable place (usually a cavity in a dry earth bank or in some dark recess under a ledge of rock) to begin building her nest. These wasps protect their many tiers of brood cells by building a bag of several layers of fragile paper made from wood pulp prepared by their own jaws. A few cells only are built at first, and a single egg is laid in each. When these eggs hatch the resulting grubs are fed by the queen during the summer on a diet of masticated insects of all kinds which she catches herself. As each grub grows the queen builds up the cell walls, making them hexagonal in form, similar to the wax cells of the honey bee, and also begins other cells around them in which more eggs are deposited. In about 28 days after the first eggs are laid an equal number of worker wasps emerge from the cells. The new arrivals enlarge the nest, build additional new combs, and extend the paper walls sufficiently to develop second and subsequent batches of larvae. Worker wasps develop in rapid succession and soon the queen has a large army of assistants and finds herself relieved of all her earlier duties except that of maternity. All the new arrivals are workers (imperfect females) until late in the season or early autumn, when numbers of males and young queens are produced. Throughout the spring and summer they feed practically exclusively on other insects; but in the autumn, before the workers, males, and the old queen die, and when all brood-rearing ceases, these wasps may become a nuisance to the housewife and to the orchardist, because of their fondness for sweets, including fruit juices. They are also reported to rob beehives, but they could have very little ill effect on strong colonies and they definitely do not store honey in their nests, as no food is required for winter consumption.



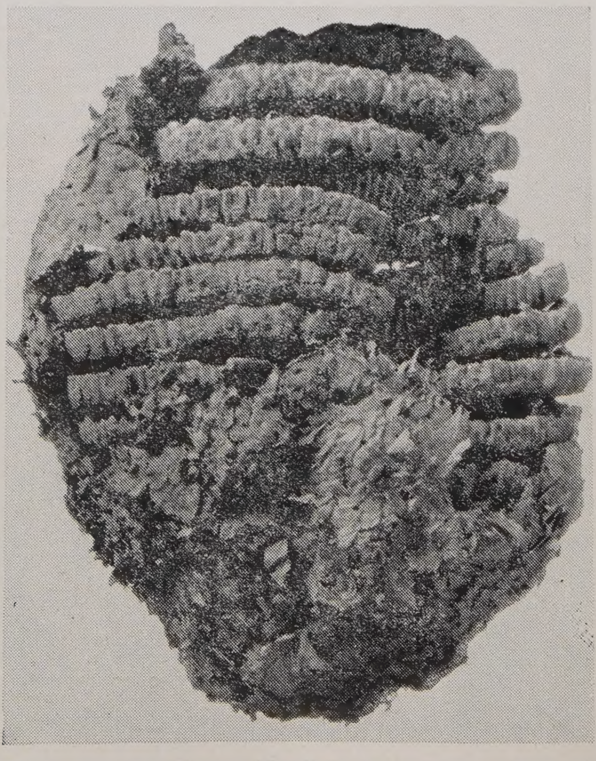
Queen wasp *(Vespa germanica)*.

Unlike the honey bee, which dies once it loses its sting, the female wasp can sting repeatedly, and the pain is usually more severe than that from the sting of the honey bee. It is unfortunate that these insects have become established in New Zealand, and while they are regarded as being more of a nuisance than a major pest, it would be desirable to eradicate them, if possible, while the infestation is more or less localised as at present. This could be done only by the vigilance and prompt action of the general public in locating their nests and destroying them whenever opportunity occurs. The outside paper covering of the ordinary wasp nest is a greyish colour, and the nest illustrated, which was dug out of a clay bank in the Hamilton district last summer, measures 15in. deep and 9in. wide. These nests may be located by watching the regular flight of the wasps in any particular direction, especially near ground level or towards the entrance to a hole in the ground or road culvert where they sometimes build.

Control

Bearing in mind the life history of the wasp, it can be kept in control as follows:—(1) By killing the queens whenever seen. These can be recognised by their larger size and by the fact that they are the earliest wasps on the wing. (2) By destroying the community.

When a nest is located a full tablespoon of calcium cyanide (or more according to the size of the hole) may be placed inside the hole late in the evening when all the wasps are at home, and the hole should then be plugged with a wad of grass and covered with earth until the next day, when the complete nest should be dug out and destroyed by fire. Where a nest is sufficiently exposed it may be dealt with by spraying kerosene or benzine over it, and immediately destroying the lot by fire. This work should be done, if possible, before the young queens and males are raised in the autumn.



Wasp nest found near Hamilton last summer. Part of outside covering removed to expose the combs.

Head of wasp showing strong mandibles and long drooping antennae.

To assist in the eradication of these wasps members of the general public are urged to do one of two things when a nest is located in their neighbourhood: (1) deal with the nest promptly as described above, or (2) communicate immediately with the Apiary Instructor, Department of Agriculture, advising him of the exact location of the nest. These officers can advise where calcium cyanide can be obtained, or could attend to the destruction of any nests located when next visiting the locality if the person concerned is unable to attend to the work.

The comparatively small nests of tree wasps, an Australian species, which are now fairly common in orchards in the Auckland and Wairarapa districts, do not come within the above category, as their nests can be more readily dealt with by orchardists and others by burning them out with a torch or blow-lamp, or by snipping off the twig to which they are attached and dropping the complete nest into a benzine tin half full of boiling water, or water on which there is a heavy coating of kerosene. After dark on a cold night is the best time to carry out this work, and care should be taken not to disturb the wasps inside the nest unduly when taking down the nest.

Fields Division Officers

NEW APPOINTMENTS

A NUMBER of promotions and new appointments of senior officers of the Fields Division of the Department of Agriculture have recently been announced.

Mr. J. M. Smith, who has been Acting Director of the Fields Division, now becomes Director.

Mr. J. W. Woodcock, who has been Fields Superintendent at Dunedin, has been appointed Assistant Director of the Fields Division, Wellington, and Mr. A. G. Elliott, Crop Experimentalist, Wellington, becomes the new Fields Superintendent at Dunedin. Mr. P. B. Lynch, who has been assistant to Mr. Elliott, is appointed Crop Experimentalist, Wellington.

A new position of Agronomist has been filled by Mr. J. H. Claridge, who has been Seed Certification Officer, Wellington.

Mr. J. E. Bell, who has been Land Utilisation Officer, Wellington, has been appointed Fields Superintendent, Auckland.

Mr. S. H. Saxby, a specialist in grassland farming, is to fill the new position of Agrostologist, Wellington.

Mr. I. L. Elliott, who has been Supervisor of Fertiliser Supplies, Wellington, has been appointed Assistant Superintendent of the new Soil Fertility Research Station, Hamilton.

FARMING A SMALL HOLDING

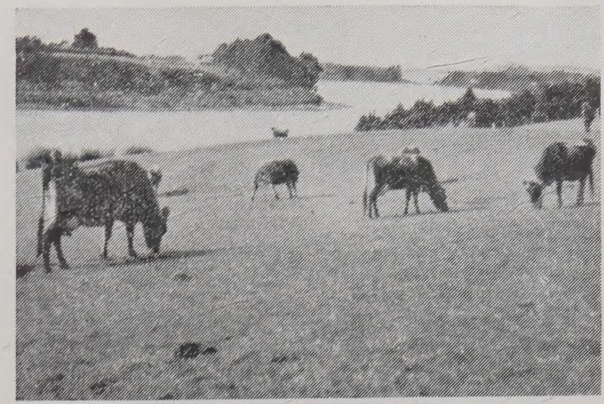
Mixed Fruit and Dairy Farm in Tauranga District

IN a climate favouring a wide range of readily marketable crops and produce a reasonable income and a fair way of living may be enjoyed on a small holding by a man who is prepared to work hard and wait for his reward. One man's efforts which are reaping the success they deserved on a small farm in the Bay of Plenty are described in this article by I. L. Nottage, Orchard Instructor, Tauranga, and A. V. Allo, Instructor in Agriculture, Tauranga.

The farm buildings with a severely-trimmed barberry hedge in the foreground.

THERE are probably few areas in New Zealand offering greater possibilities for diversified farming than does the Tauranga district. One of the first things that attracts the visitor to the Bay of Plenty is the suitability of the country for grassland farming. Under the conditions prevailing in the bay pastures yield very freely, and all types of stock do very well. As a producer of citrus fruits Tauranga is well known throughout New Zealand, and its production of 60,000 to 80,000 cases of lemons annually makes it easily the biggest lemon-producing district in the country. In fact, rather more than half the Dominion lemon crop comes from the Bay of Plenty. Poultry thrive and produce well, and the district is particularly suited for winter egg production. Many sub-tropical fruits such as tree tomatoes, Chinese gooseberries, passion fruit, and feijoas can be produced in selected localities in the Tauranga district, which may well be described as truly a "bay of plenty."

The climate of the Bay of Plenty district is ideal. There is an ample rainfall fairly evenly distributed throughout the year, while the weather is relatively mild, and although frosts are not uncommon, they are slight compared with those experienced in most other districts.



Pastures bordering the waterfront of the Upper Tauranga Harbour.

Popular District

The Tauranga district consists of an undulating coastal belt varying in depth from 5 to 10 miles, and gradually merging into more hilly country that rises to the crest of the Kaimai Hills. As is common with most districts of this type, the coastal country is far more densely settled than the hilly hinterland, where there is still a large area of country awaiting development. The soil of the district is in general a light pumice loam, tending to be slightly heavier round the coast. This soil is very kindly to work, does not get sticky in wet weather, and even after prolonged heavy rain it is only a short time before it can be worked with implements. The porous sub-soil provides excellent drainage.

In the early years of development of the Tauranga district a considerable area of maize was grown each year, but, with the increasing expansion of dairying, coupled with the use of better strains of pasture plants, the area in crop was showing a steady decline prior to the outbreak of war. Of recent years the farmer in the bay, in common with those in other parts of New Zealand, has increased his cropping area, particularly so since the Government appeal for increased production of pig-meats.

With such ideal conditions for farming, coupled with the presence of the thriving town of Tauranga, a fine ocean beach at Mount Maunganui, and excellent fishing in the waters of the Tauranga Harbour, it is not difficult to explain the steady influx of settlers to

Tree tomatoes have replaced some of the lemon trees in this part of the orchard.

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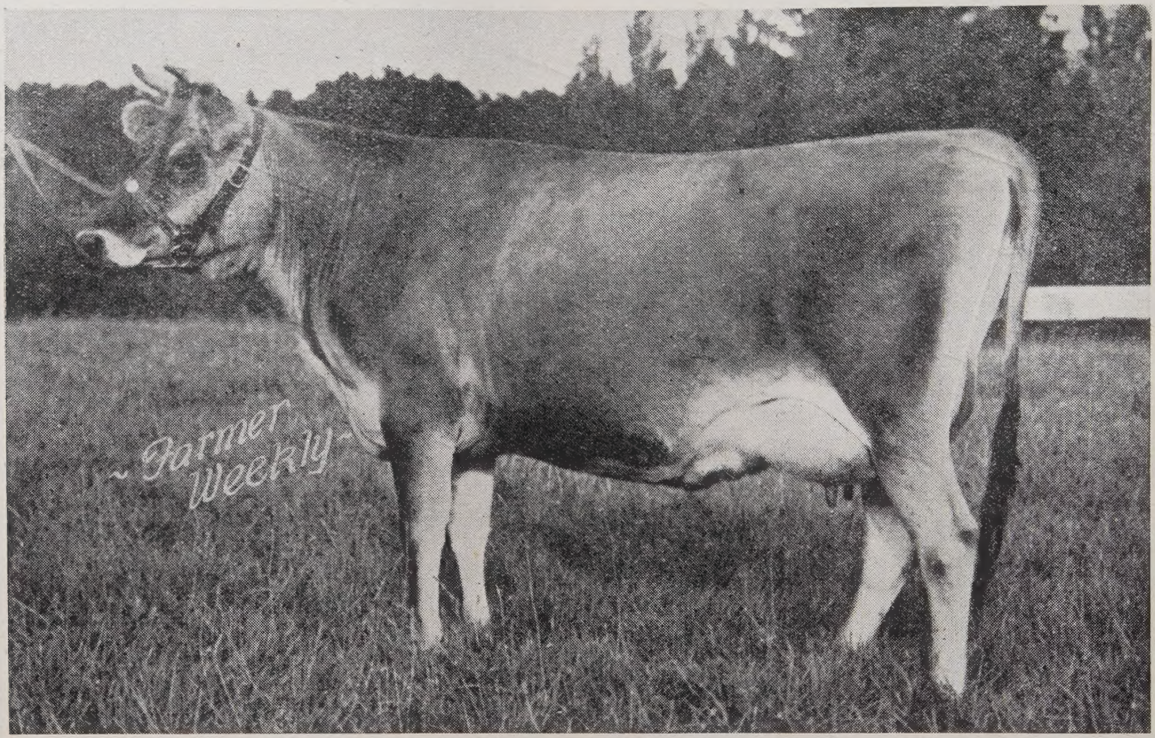

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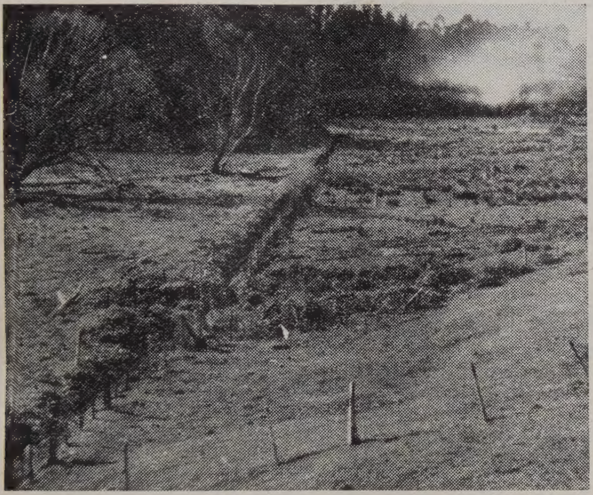
the bay from other parts of New Zealand. Many farms have changed hands over the past few years, and there has been a tendency for many of the larger farms in the coastal areas to be split up and sold as smaller units, on quite a few of which mixed dairy and fruit farming is practised.

Small Mixed Farm

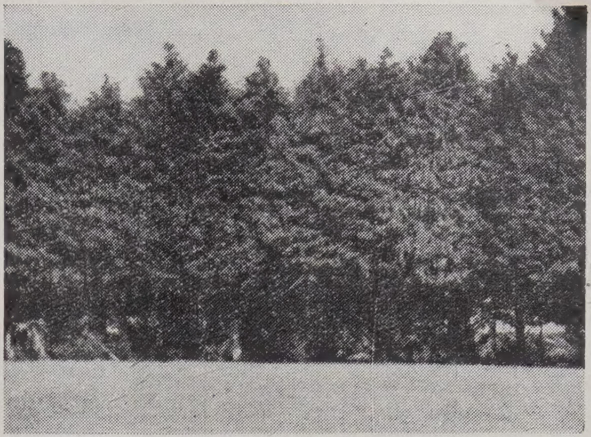
The area of such farms varies considerably, some making dairying the main source of income, while others concentrate mainly on fruit production, with a few cows as a sideline. For the purpose of this article a small mixed farm in the Gate Pa district has been selected, and the farm management methods are here described. As the farm in question was occupied by its present owner in 1918, and has been operated continuously since as a mixed farm, it is obvious that the owner is well satisfied with his venture. He has brought up a large family on the area, which today, with a well-established orchard and well-fenced and sheltered fields of good pasture, has the appearance of being a highly successful economic unit of production.

The farm, which has a total area of 38½ acres, is situated on the waterfront of the Upper Tauranga Harbour, in the Gate Pa district, about 4 miles from Tauranga. There is about 400 yards of beach frontage on the property, with good flounder fishing within 50 yards of the house. There are about 9 acres of foreshore flats, most of which are reasonably well developed, and which are backed by a fairly steep cliff about 30ft. in height, while the balance of the farm is at the top of this cliff, and consists of gently rolling country. The area, with its northerly aspect, gets the maximum sunshine, and is remarkably warm, even in the middle of winter.



Part of the drained flat which it is intended to regrass.

Discouraging at First



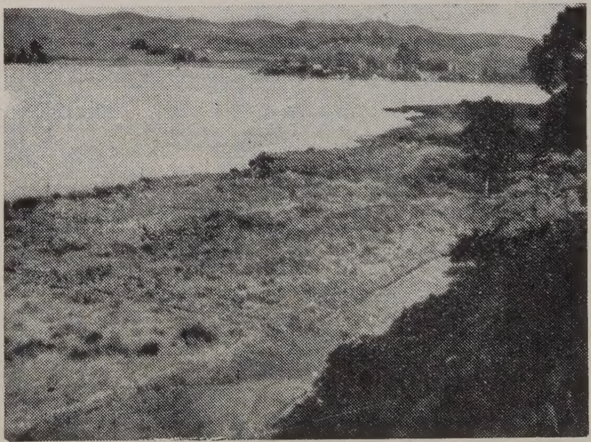
An example of the dense shelter which is a feature of the farm.

The farm was taken over in 1918 by its present owner, who, prior to coming to Tauranga, had had farming experience in Canterbury and the Waikato districts. It was a most discouraging prospect at first, being covered with gorse and ratstail, and the prospects of making the area capable of rearing a large family in reasonable comfort appeared remote. During the first year or two the owner had the greatest difficulty in running eight cows on the area, and found that it was impossible to rear young stock. However, he decided that the only way to bring the area into production was to tackle a small portion each year, as his finances would allow, and to clean up the area as he went along. One of his first jobs was to establish an orchard, and his experiences in this direction will be described later in this article.

For the first year or two he cropped his farm, mainly with maize, until the ground was reasonably clear of gorse and then sowed down the best pasture mixture obtainable in those days. All his pastures have now been down over 20 years, and their appearance today speaks well of the time and trouble he spent in cleaning up his land. Once he had his paddock sown down in grass, he discontinued his cropping, and for the past 20 years has done no cropping on his dairy farm.

Pasture Management

At present the dairying portion of his farm is 35½ acres in area, while the balance is in orchard and asparagus and contains the house and flower garden. The dairy farm is divided into twelve paddocks, ranging in size from 1 to 4½ acres. The pastures are a well-balanced mixture



Some of the foreshore is well drained and carries a strong sole of paspalum with some rushes.

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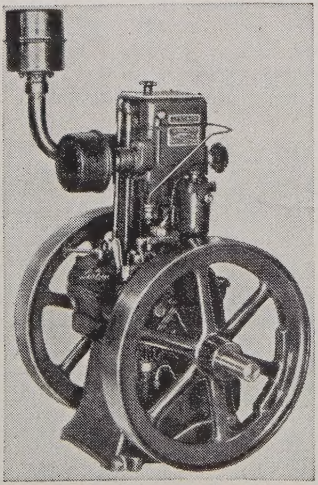

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of ryegrass, paspalum, and white clover, very free of weeds and reasonably well managed. The total area in lucerne is 3½ acres, in two paddocks, both of which have been down over 20 years. At present these stands are starting to run out, and weed invasion is severe, the worst trouble being given by creeping mallow and white clover. The stands have been on the weak side for the past two or three years and the farmer has been grazing them off in the spring with his milkers prior to shutting them up for hay. Even so, they produce four or five good cuts of hay each year. Next autumn the farmer intends discing up these two paddocks and oversowing with prairie grass, which will enable him to increase the production of this area to a considerable extent.

The 9 acres of land along the foreshore is by no means fully developed and is inclined to be swampy. About 4 acres are well drained and at present carry a strong sole of paspalum with some rushes. It is intended to disc over this area next autumn and oversow with ryegrass and strawberry and white clover. The balance of the foreshore had a good mixed sward until disturbed by defence works in 1942. Since then rushes have come away rather badly and the finer grasses have disappeared. It is intended to regrass this area once the defence works have been removed and the ground restored to its original condition.

The area is well laid out and races are used to give access to the paddocks. It is considered that an extension of this race system would allow greater efficiency of pasture management. If this were done, the whole farm could be rotationally grazed and the stock kept in one paddock only and not be able to get into any other paddock. As it is, a modified system of rotational grazing is practised, the only drawback being that it is not possible to graze all fields as separate units, as there is no water laid on one field.

Up to the past two years the farmer had been in the habit of winter spelling a couple of fields so that ample grass would be available for his early calvers until the spring growth started. Since the lucerne has started to run out, however, he has grazed his milkers in the spring on the lucerne paddocks for one hour daily.

The farm is exceptionally well sheltered. Boxthorn provides dense windproof shelter many feet in height, while barberry and *Lawsonianas* are also effective.

Situated as it is on the outskirts of the Tauranga Borough, the farm is connected with the town water supply, which is a great asset. There is only one trough, situated in the main yard, available to the stock, which have to pass down one of the races to get water. However, the actual distance that the stock have to travel at any one time is not great, although it is considered it would be an improvement to have one or two troughs located in convenient places in the fields.

No cropping is done for the dairy herd or pigs. Hay is cut from the lucerne (four or five cuts a year, depending on the season), while a cut of hay is taken from the bull paddock. This is usually cut in January, when there is a good growth of young paspalum and clover. Altogether about 25 tons of hay are cut annually.

As on all other farms in the country over the past few years, topdressing has been restricted by fertiliser rationing. In normal times the farm used to receive two dressings annually, one in the early autumn and the other in early spring. Superphosphate at 2cwt. per acre was the main dressing used each time, although an occasional dressing of blood and bone was applied. All cowshed manure is applied to the asparagus beds. Liming has also been attended to on this property, and the grass receives 4cwt. per acre annually and the lucerne 6cwt. per acre. The paddocks are kept well harrowed at all times and are given a stroke of the chain and tripod harrows after every change of grazing. The sward is remarkably uniform, with no sign of the rank patches so common on pastures where harrowing is neglected. The mower is kept in use every autumn topping excess paspalum growth, and the pastures demonstrate clearly how adequate topping will aid in maintaining a well-balanced sward on paspalum country.

Livestock

The farmer milks a herd of 24 grade Jersey cows, which last season produced 5,000lb. of butterfat. In addition to the herd there are four springing heifers, five heifer calves, one pedigree Jersey bull, and one horse. The aim is to have the cows calve during July and August, when the spring growth is commencing to come away. In addition to the dairy herd there are at present three breeding sows, with a Berkshire boar.

The pig layout is simple, but good, the houses being of timber, and there is a good grass run-off. The farmer has adopted the policy of selling his young pigs as weaners, and last year cleared £50 from his pigs.

There is a small flock of 40 hens which last year brought in £27 clear to the farm income. Until a year or two ago there was a flock of 150 birds, but shortage of feed and labour made it necessary to reduce their numbers. The birds are given a mash in the morning, with curds at midday and grain at night, and have a free range of the grass.

Buildings and Implements

The range of implements available on the farm is quite adequate for the dairying operations, and consists of a dray, topdresser, horse mower, hay rake, and chain and tripod harrows.

There is an adequate range of buildings available, chief of which is a well-built hay shed capable of holding the season's cut of hay. One end of this shed is used as a calf house. There is a handy cow shed, quite adequate for the small herd milked, with a two-cow milking plant and electrically driven separator. In addition, there is a combined implement shed and fruit packing shed, a spray and manure shed, and a maize crib, relic of the days when maize was the main source of cash in the farm income. This crib is now used as a general storehouse.

The Orchard

Within the 25 years of its existence, the orchard section of this farm has experienced a somewhat chequered career. Commenced a quarter of a century ago with about an acre of lemons and half an acre of mixed trees, mainly apples, the ups and downs it has weathered provide use-

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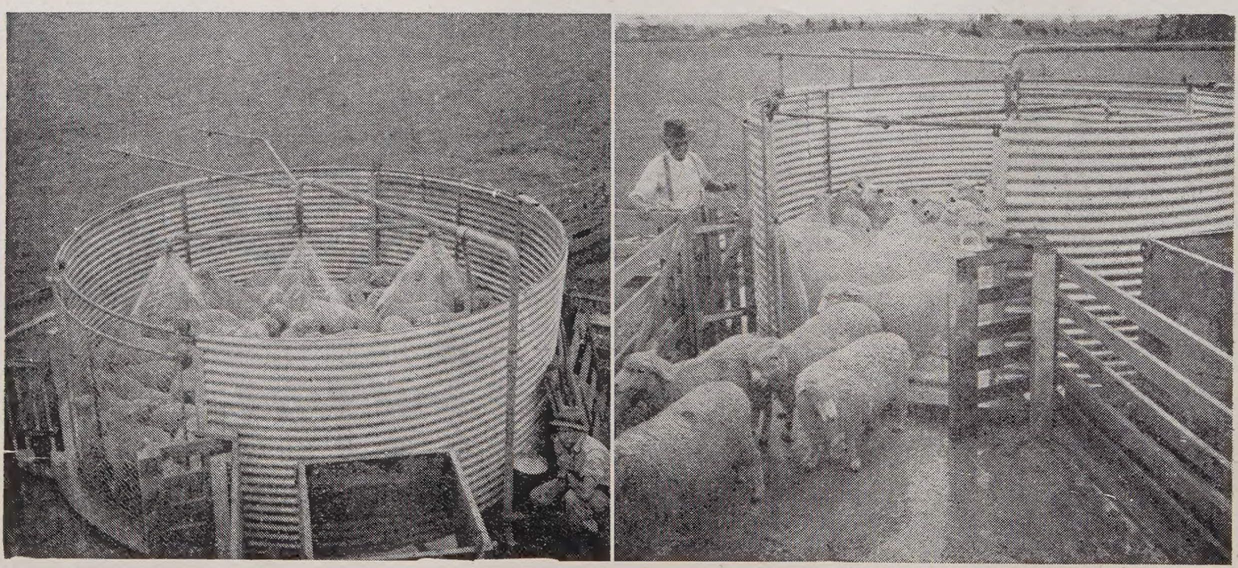

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WELLINGTON

ful lessons to others, while the fact that it has been maintained through the years as a productive unit of the farm indicates that fruit and vegetables may well be used to turn a relatively small farm into an economic unit.

A bed of asparagus, half an acre, now 24 years old, was established between the fruit trees. Originally planted to secure a quicker return while fruit trees developed to full production, the asparagus has been retained and still produces 1,800 to 1,900lb. of tips each year, though the quantity is reducing as the fruit trees overshadow the beds and the plants grow older. Hand cultivation and harvesting take a fair amount of labour, but other costs are small. Manure is almost all provided by the farm cattle and fowls, but some blood and bone has been used. Manure used in good quantity for the asparagus has also benefited that block of fruit trees.

The area in lemons was increased to 1½ acres in 1923 by the planting of a further 36 trees, while about a dozen more lemons were planted about 1938. The latest planting was in 1940, when 40 New Zealand grapefruit were used to replace some of the apples.

During the last few years more than half of the old lemon trees have been removed. These would have been replaced with New Zealand grapefruit, had trees been available, but tree tomatoes and feijoas have been used instead. The site is almost ideally situated for tree tomatoes and such fruits, for it is nearly free of frost and is very well protected from winds.

The lemon trees in the block deteriorated rapidly as a result of pigs being run among the trees. The 36 lemon trees planted in 1923 are also suffering, though not yet severely, from bark diseases affecting the trunks. Poultry have been run in this latter block. In the early days of the orchard the farmer, in common with some other fruit-growers, ran pigs and poultry under his citrus trees with the object of securing free distribution of manure to the trees. He obtained the manure, and weeds were kept in check, but he would not follow the practice again. Observations in numerous citrus orchards have shown that poultry or pigs in large numbers cause very serious injury to the trees. It appears that they create conditions favourable to the development and spread of bark blotch, a serious disease affecting tree trunks and lower main branches.

Only about 30 apple and stone fruit trees remain. Most of the fruit is used by the family and friends, but a little is sold in most years. These fruits are less suitable to the district than are citrus, and they demand strict adherence to a more exacting spray programme under Bay of Plenty conditions.

Until pigs were removed and poultry reduced in number, little cultivation was done in the orchard blocks, but horse cultivation implements are now used, except where asparagus is growing.

Spraying is provided for with a stationary plant, comprising pump, electric motor, and a 250-gallon concrete tank, from which spray is led by underground pipes to taps suitably spaced to enable the trees to be reached with 100ft. of hose.

Production from the remaining 72 lemon trees has been from 300 to 400 bushels yearly over the past five years. New Zealand grapefruit carried about 30 bushels last year and will rapidly increase until, in about eight years, they should produce over 300 bushels annually and maintain that quantity indefinitely. Miscellaneous apples and stone fruits provide fruit for the family and a few pounds in income. Tree tomatoes, feijoas, and a few passion fruit have been planted only one season, but will add appreciably to the farm returns as they commence to bear.

Except for the coastal flat paddocks, almost all of the land is suitable for citrus growing. Most of the northern slopes are suitably placed for growing tree tomatoes and similar fruits because of their sheltered and relatively frost-free positions.

On a small farm fruit growing on these lines can be very successful, but if it is attempted, provision for labour to attend to seasonal work is essential, for fruit and vegetables cannot be grown profitably unless they receive the right attention at the right times.

All-the-year-round Income

Diversity of production, associated with fairly even distribution of work over the year, planned to maintain a steady income during all seasons, has been the aim of this farmer. The degree of success he has attained has enabled him to manage the farm work with the assistance of one son and a little help from his wife in harvesting of fruit and asparagus. The relatively small area in orchard and garden crops has given the higher return per acre needed to provide a good family income. Wisely, the area in these crops was not made too large to be managed by the labour available. A nice balance between dairy and fruit production has been reached in spite of earlier difficulties.

The steady income from the dairy herd is at its peak from October to January, the smaller apple crop is harvested in autumn, followed by citrus fruit crops, which are harvested mainly from April to November. Tree tomatoes will be harvested from May to August when they commence to bear, while asparagus comes between August and October. Sales of eggs and weaners bring in useful sums in their seasons.

Last, but perhaps not least, this little farm is attractively situated, with a view of Tauranga Harbour, out of town but within very easy reach of the amenities of Tauranga Borough.

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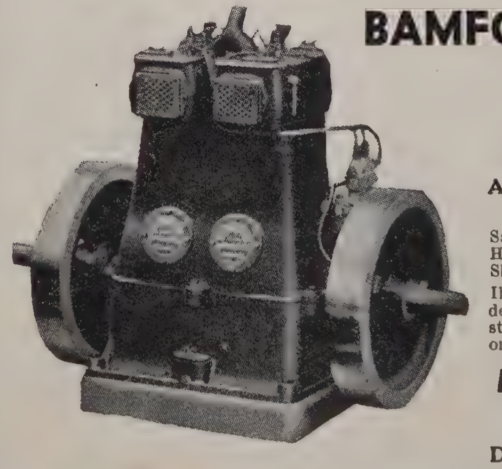

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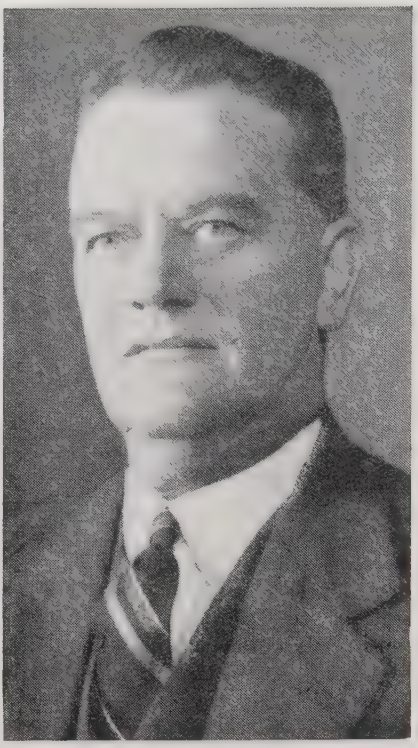
OBITUARY

Mr. C. H. Schwass

The death occurred suddenly on Friday, October 19, of Mr. C. H. Schwass, Assistant to the Director of the Fields Division, Department of Agriculture, at the age of 54.

Mr. Schwass was born at Marton, and received his secondary education at the Marton District High School. In 1907, after passing the Public Service Entrance Examination, he joined the staff of the Department of Agriculture in Wellington. In 1917 he was transferred to field duties and was successively stationed at Waipukurau, Wanganui, and Marton. In 1923, when the Fields Division of the Department was inaugurated, he was transferred to Wellington as Divisional Clerk. He was closely associated with the establishment of the Plant Research Station at Palmerston North in 1928, and at that time was transferred to Palmerston North as Divisional Clerk in the Fields Division and Secretary of the Plant Research Station. When the Plant Research Station was taken over by the Department of Scientific and Industrial Research in 1934, and the headquarters were removed to Wellington, Mr. Schwass again transferred to Wellington in the position of Divisional Executive Officer, Fields Division. This position he held until his appointment to the position of Assistant to the Director of the Fields Division.



Mr. C. H. Schwass

Mr. Schwass always showed the greatest interest in Public Service affairs, and before the introduction of compulsory military training he held the rank of colour sergeant in the Civil Service Rifles. He was also a keen bowler. His advice and organising ability will be a very keen loss to the Department.

Mr. Schwass is survived by his wife and one son, Mr. R. H. Schwass, of the Animal Research Station, Wallaceville.

◆

Radio Broadcasts

A SERIES of six B.B.C. talks on agricultural subjects recorded in Great Britain is to be broadcast from Station 4YA Dunedin on six successive weeks, commencing on Tuesday, January 8, at 7.15 p.m. These interesting and well-presented discussions cover a wide range of farming, and though some of their conclusions are not directly applicable under New Zealand conditions and some of the farming practices are entirely different, they contain much of value and interest to local farmers.

1 Man does work of 8

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WITHOUT HELP as he previously did with 3 drivers (working 3 machines), 3 mixers in shed and 2 men carting out. (Mr Kelly Caughey's letter on file).

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FARMING IN NEW ZEALAND

Wartime Farming

NEW Zealand is essentially a pastoral country, and as our main products come from the animal, wartime farming must be reviewed mainly on the efficiency with which we managed our flocks and herds and met the changing demands for products as the war progressed. An appreciation of the Dominion's agricultural war effort from this standpoint is contained in this article by P. W. Smallfield, Director, Rural Development Division.

TO understand fully the production and administrative problems of the Dominion during the war years, some thought should first be given to the general set-up of the primary industries prior to the war and the reasons why New Zealand has adopted certain farm management methods and concentrated on the production of dairy produce, meat, and wool.

In the first place New Zealand is a pastoral country; of the 43 million acres in occupation, 31½ million acres are in pasture of various types and 1⅓ million acres are devoted to annual crops, of which approximately half are cereals and half fodder crops. The pasture land and fodder crops support 33 million sheep (including nearly 21 million breeding ewes) and 4¾ million cattle (including 1¾ million milking cows). This pastoral set-up has developed in response to the demands of the United Kingdom market, and our farm management methods are based largely on the breeding animal and milk-producing pastures. This combination of grass and the breeding animal in our mild climate (obviating the heavy labour requirements for stall feeding in the winter) and accompanied by the adoption of labour-saving machinery has enabled our dairy and meat export industries to be built up and maintained against competition **by our high output per unit of labour.** For instance, under our grass-farming methods, one man can milk, feed, and manage a herd of 25 to 35 cows, a man and a boy a herd of 50 to 60 cows, two men 70 to 80 cows, and three men 100 to 110 cows, or in fat lamb production one man can look after 750 to 1,000 ewes. In general our farms are specialised, and with permanent labour fully employed at the main enterprises, sidelines are not popular. For instance, a dairy farmer can manage a certain amount of pig-keeping work, but for a considerable increase in output it would require more time than he could spare, and production to the level of full employment for an additional man would result in a reduction in production from the main enterprise because of competition of the two activities for the use of land.

It is this pastoral set-up which makes food production in the Dominion rather inelastic. Any marked increase in production on traditional lines would have required a greatly-increased pastoral area and increased numbers of livestock. At present the Dominion has already developed all the easily-cultivatable lands and increases in production can only be obtained slowly as existing pastures are improved, livestock more adequately provided with suppletary feed, and new land of low initial fertility gradually developed.

Perhaps we can appreciate our own problems best by first considering what Great Britain did during the war to increase food production, as a contrast is often made between the food production efforts of the two countries.

Between 1939 and 1944 the area under annual crops in the United Kingdom increased by 6 million acres (from 8½ million acres to 14½ million acres), while the area of permanent grass decreased by a like amount. Milking cows increased by 3 per cent., total cattle by 7½ per cent., but sheep decreased by 25 per cent., pigs by 57 per cent., and poultry by 25 per cent. In short the United Kingdom, faced with the necessity of producing as much food as possible and providing a balanced diet, turned to cereal production in preference to sheep farming, maintained milk production, but reduced the numbers of pigs and poultry, whose feeding in pre-war years was largely dependent on imported grain.

Such action was not required of New Zealand. At first we were asked for our traditional products of meat, wool, and dairy produce, and then later, after Japan entered the war, for additional products such as vegetables, potatoes, onions, fruits, and fibre. A review of wartime production is given in the following table (1):—

	Average of five seasons 1934-39.	Average of five seasons 1939-44.	Forecast for 1945-46 season.
	tons.	tons.	tons.
(1) Butterfat	189,900 (5)	191,500 (5)	193,000
(2) Meat ..	470,000 (6)	526,000	537,500
(3) Wool ..	134,000	148,000	166,500
	acres.	acres.	acres.
(4) Area under chief cash crops ..	348,700	406,500	353,500

(1) Year ended July 31.

(2) Year ended September 30.

(3) Year ended July 30.

(4) Wheat, oats, barley, maize, peas, and beans for threshing, potatoes and onions outside boroughs.

(5) Owing to change in allowance of butterfat represented in milk and cream consumed, the total butterfat figures given are higher than those quoted in previous years.

(6) Three seasons only: years ended June 30.

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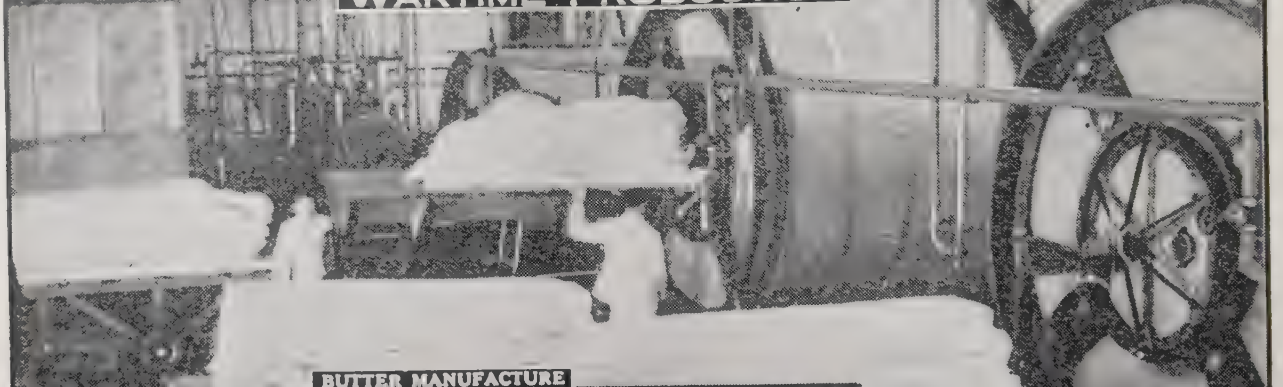
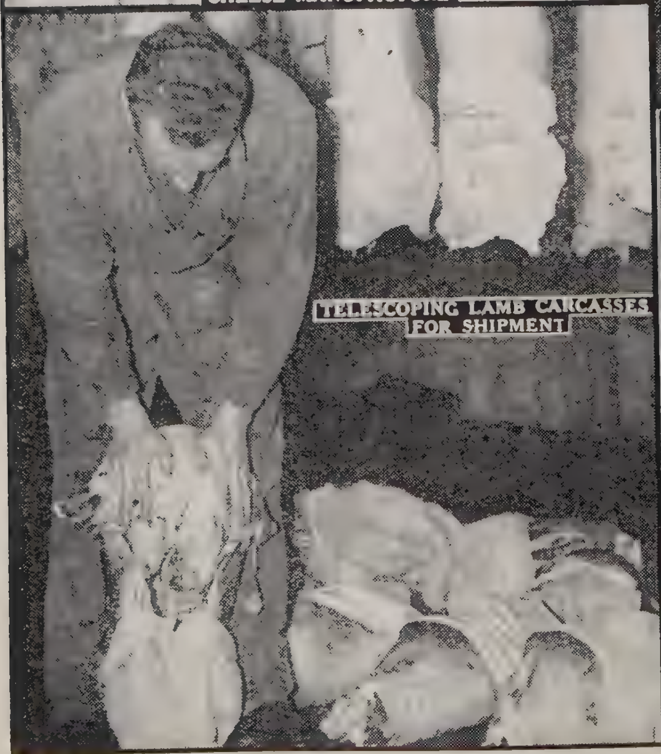
(1) Adapted from annual report of the Director-General of the Department of Agriculture, 1945.

WARTIME PRODUCTION



BUTTER MANUFACTURE

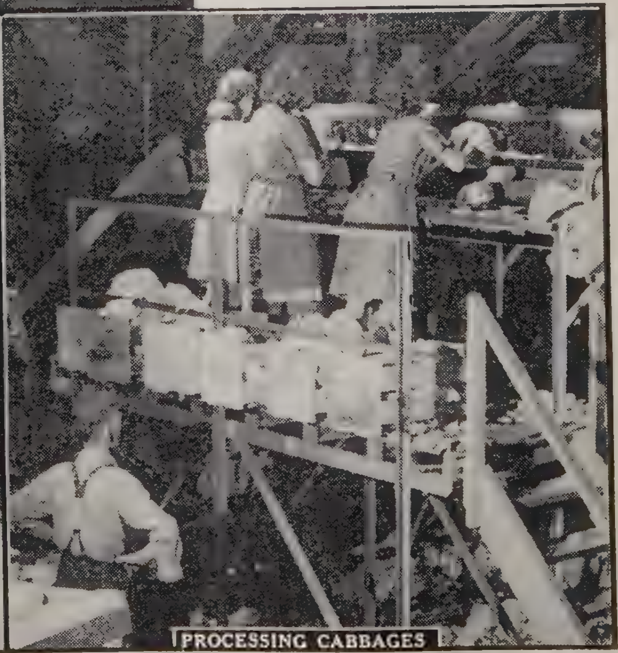
CHEESE MANUFACTURE



TELESCOPING LAMB CARCASSES FOR SHIPMENT

The Dominion supplied approximately the following quantities of foodstuffs to the United Kingdom and United States Governments during the six war years 1939-40 to 1944-45.

	Tons.
Meat ..	2,100,000
Dairy produce	1,400,000
Fruit and vegetables .	170,000
Cereal foods .	75,000
Miscellaneous	55,000
	3,800,000



PROCESSING CABBAGES

Animal products have increased during the war years despite labour and fertiliser shortages, and the area under arable crops has been extended.

Finally the Dominion's war effort in food production is summarised in the following table, which shows the approximate quantities of foodstuffs supplied to the United Kingdom and United States Governments during the six war years 1939-40 to 1944-45.

	Tons.
Meat	2,100,000
Dairy produce	1,400,000
Fruit and vegetables ..	170,000
Cereal foods	75,000
Miscellaneous	55,000
Total	3,800,000

Preparation for War

The possibility of war was recognised after Munich, and steps were taken during the early part of 1939 to provide the necessary administrative machinery to cope with any emergency which might arise. Plans were made with the United Kingdom Government for the purchase of exportable foodstuffs from the Dominion and for the Marketing Department to be the authority in New Zealand for the bulk purchase and shipment of various food and other products. The Emergency Regulations Act was drafted, together with the regulations necessary to mobilise and control the full resources of the Dominion.

The Primary Industries Emergency Regulations, 1939, and subsequent amendments covered the production and processing of all primary products. These regulations empowered the Primary Industries Controller to direct the production and manufacture of primary products, to requisition land, buildings, machinery, and goods, and to ration and control essential supplies: in short to do almost anything which might be required in the interests of primary production.

Full powers of control have not been required or exercised as, for instance, they have been in Britain under similar regulations, where farmers have been directed to grow certain crops and where farmers have been removed from their farms for inefficiency. The chief controls exercised under these Emergency Regulations have been over the manufacture of butter and cheese so that the United Kingdom's requirements for cheese could be met, over the sale of fat stock, seeds, and other essential supplies such as machinery, wire, etc., and rationing and manufacture of fertilisers.

In addition to the framing of regulations the two most important steps taken to meet the war emergency were the setting up of committees to review the supplies of essential commodities and to set up Primary Production Councils to bring the administration in direct contact with the individual farmer.

For instance, the Commercial Advisory Committee, composed largely of representatives of the grain and produce trade, has advised the Primary Industries Controller on the farmers' requirements for essential supplies and has enabled the Controller to recommend the necessary export or import of goods so that only surpluses above the Dominion's requirements were exported and only essential supplies were imported.

The Primary Production Councils served a very important function and were organised so that direct touch was secured with individual farmers. District Councils were set up composed partly of district committeemen and partly of representatives of other farming organisations and labour. Each district committee was composed of members who were in contact with all the farmers in the members' locality. Finally a National Council representing the District Councils and farmers' organisations advised the Minister of Agriculture and the Primary Industries Controller on policy matters and directed the work of the District Councils.

The Primary Production Councils have done an immense amount of voluntary work in connection with man-power on farms, reporting on appeals for the Armed Forces Appeal Boards, estimating labour requirements for harvesting and organising both voluntary and Army labour, organising drives for production, rationing supplies of essential commodities such as fertilisers, gumboots, farm machinery, wire and wire netting, building materials, etc. Without such an organisation it would have been impossible to stimulate production, ration essential requirements, and provide the necessary farm labour.

September, 1939, to December, 1941

The first phase of the war was marked by adherence to traditional farming practice and by endeavours to increase production by better management and feeding of our flocks and herds. Shipping difficulties arose fairly early in the war, but the erection of additional cool storage space enabled the Dominion's produce to be held until ships were available. At the outbreak of war the Government had taken the necessary steps to ensure that as a condition of their slaughtering and export licences all freezing works should at their own expense provide sufficient cool storage space for holding 60 per cent. of their average kill of meat; this resulted in the provision of an additional 3½ million cubic feet, capable of holding 37,000 tons of meat. In addition, shortly after the outbreak of war the Government arranged for the erection of an additional 4¾ million cubic feet of cool storage capable of holding 51,000 tons of meat. This gave a total storage capacity for 250,000 tons of meat, excluding freezer space which would store a further 57,000 tons. Lamb and mutton carcasses were telescoped and ox and prime cow beef boned for shipment. The number of ports of loading were reduced and all possible steps taken to ensure that ships available were loaded to capacity and that cool storage space would bridge any foreseen gap in loadings.

During the early seasons of the war bulk purchases were arranged with the United Kingdom on a seasonal basis for butter, cheese, and meat. The contract for wool covered the 1939-40 season and succeeding wool clips during the war and for one season after. Tallow and processed milk were purchased on behalf of the United Kingdom Government and control was arranged for the sale of woolly sheep skins and hides.

SEEING THINGS THROUGH

Transportation's Task as Hard as Ever

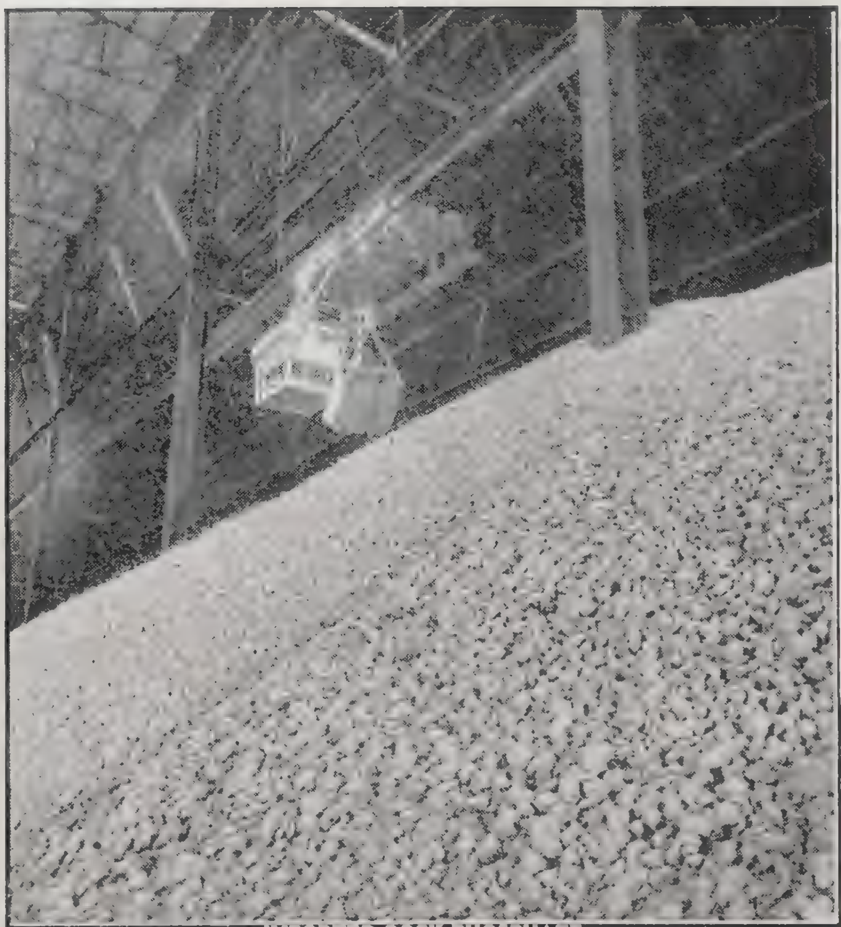
Transportation's problems did not end on VJ Day. The re-allocation of industry and the re-adjustment of our national life bring new and vital transport problems which the flexibility and skilful organisation of railways alone can solve. In meeting now these urgent post-war needs, the railways continue to play an important part in New Zealand's peacetime development.

Progress Today - - Pleasure Tomorrow

FERTILISER

After Japan's entry into the war in 1941 the Dominion's normal source of supply of phosphate rock from Nauru and Ocean Islands for the manufacture of superphosphate was cut off and alternative sources of supply had to be secured, supplies being obtained from Florida, Makatea, and the Red Sea. Rock phosphate imports dropped from 250,000 tons in 1941 to slightly over 100,000 tons in 1942. Fertiliser rationing was introduced and the phosphate quarries at Clarendon, Otago, were reopened and supplied small quantities of rock for superphosphate manufacture as well as supplies of low-grade phosphates which were utilised in fertiliser mixtures.

[*Photo at top left by Sparrow Industrial Pictures.*



IMPORTED ROCK PHOSPHATE

CLARENDON PHOSPHATE QUARRIES

During the 1939-40 season the export position was satisfactory and a clearance of accumulated meat from the previous seasons was made. Although no bulk purchase was arranged for apples, half a million cases were shipped. For the 1940-41 season contracts for the sale of produce were arranged generally as for the first season of the war, but increased production of cheese and smaller quantities of meat were asked for.

Interference with the loading facilities at Nauru Island coupled with the sinking of phosphate supply ships made it impossible for the Dominion to obtain the full quantity of phosphate rock required, and it became evident that phosphatic fertilisers would have to be rationed. Consequently in June, 1941, the Phosphatic Fertiliser Control Notice was issued to ration available supplies of phosphatic fertiliser for topdressing and for crops. Later rationing was extended to other fertilisers and continued throughout the war.

Fertilisers, particularly phosphatic fertilisers, are of extreme importance in New Zealand farming. Total fertiliser usage was about 500,000 tons prior to the depression in the thirties and dropped to 370,000 tons in 1934-35; usage rose again to 500,000 tons in 1936-37 and then steadily rose to 698,000 tons in 1940-41. After Japan's entry into the war in 1941 our normal source of supply of phosphate rock from Nauru Island and Ocean Island for the manufacture of superphosphate was cut off and alternative sources of supply had to be secured, supplies being obtained from Florida, Makatea, and the Red Sea. Rock phosphate imports dropped from over 250,000 tons in 1941 to slightly over 100,000 tons in 1942.

The assistance of the National Council of Primary Production was sought in defining a rationing schedule based on minimum phosphatic fertiliser requirements for each annual crop and a topdressing ration based on a percentage of previous usage. Committees had to be set up to deal with hardship cases.

To make the fullest use of available supplies of phosphate attention was given to making the most efficient type of fertiliser. Normally superphosphate is the commonest phosphatic fertiliser used in New Zealand: the phosphate, being water soluble, is easily locked up in the soil. To lessen this loss of phosphates the National Council of Primary Production recommended the manufacture of serpentine superphosphate. This is manufactured by adding 1 part of ground serpentine rock to 3 parts of superphosphate, giving a magnesium instead of a calcium phosphate. In general, 1cwt. of serpentine superphosphate gives equal results to 1cwt. of superphosphate.

To increase further the phosphate supplies the phosphate quarries at Clarendon, Otago, were re-opened and supplied small quantities of rock for superphosphate manufacture as well as supplies of low-grade material which was utilised in fertiliser mixtures.

December, 1941, to VJ Day

With the entry of Japan into the war many new problems arose. Increased attention had to be paid to the production of food crops, and the Dominion was faced with increasing shortages of essential supplies, which were later largely overcome through lend-lease aid.

Shortage of labour on farms, which was a limiting factor in production throughout the war, became acute soon after Japan's entry into the war. Farm work is a skilled occupation, and particularly so in New Zealand, where livestock are so important. Labour difficulties in many industries important in the war effort were overcome by declaring them essential; thus labour could be directed to them, and employees could not leave or be discharged without the approval of the National Service Department. Farm labour shortages could not be overcome in this way: the farmer and his employees either live together or live in such close contact that control as with other essential industries was not possible. The policy through the war was to retain essential workers on farms and arrange for the placing of volunteer workers. After the war situation in the Pacific became less acute men were returned from the forces for farm work and women recruited for land work.

Primary Production Councils played an important part in assisting the National Service Department and the Armed Forces Appeal Boards in seeing that farms were adequately staffed as far as permanent workers were concerned. For harvesting other steps had to be taken. Army labour was first used in the cereal harvests in the South Island in the autumn of 1943 and extended in the following year to the hay and silage harvests in the North Island. The work was organised through the Primary Production Councils.

The rationing of many farm requisites such as imported farm machinery, tractors, fencing wire, wire netting, gumboots, etc., became necessary after Japan's entry into the war. This work was done by the Department of Agriculture through Primary Production Councils, who nominated priorities so that supplies could be distributed to farmers who would make the best use of them.

During the 1941-42 season, which marked the entry of Japan into the war, the annual contracts which were made with the United Kingdom made provision for purchase of produce whether shipped or unshipped, for the accumulation of butter, cheese, and meat were giving some concern, while New Zealand agreed to make every effort to adapt production to shipping possibilities. During the 1942-43 season the production programme was modified to meet the new demands created by the Pacific war.

Approval was given by the United Kingdom Government to the release of meat and dairy produce required by the United States forces. With the mobilisation of the Dominion's forces

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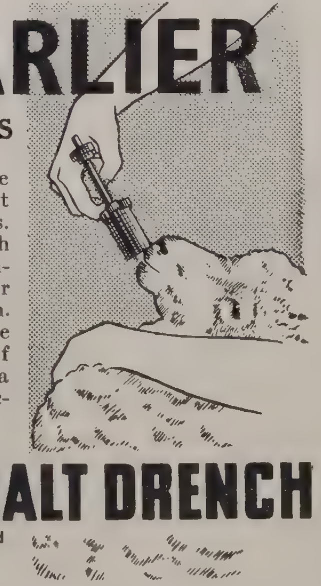
For HEALTHIER FLOCKS



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and the demands of the United States forces increased production of vegetable and food crops was required. The United Kingdom now required more butter and less cheese and a change-over in manufacture was arranged.

The 1943-44 season was marked by the introduction of butter and meat rationing in the Dominion and by arrangements for long-term contracts with the United Kingdom for the purchase of exportable surpluses of butter, cheese, and meat for the years 1944-48. Increased efforts were made to expand food production, particularly dehydrated and fresh vegetables for the United States forces in the Pacific as well as meat and dairy produce for the United Kingdom. The last season of the war was marked by unfavourable weather conditions for the harvesting and sowing of cereals, and considerable importations of wheat were necessary.

Two other important features of this period must be mentioned: the policy of economic stabilisation and the Servicemen's Settlement and Land Sales Act, 1943. On December 15, 1942, the Prime Minister broadcast an address on economic stabilisation outlining the Government's policy to prevent inflation. In September, 1939, all prices had been brought under control through the Price Tribunal and in September, 1941, 38 of the more important commodities entering into the cost of living were stabilised. Further steps were then taken to stabilise additional commodities and wages; an agreement was entered into with the Farmers' Federation for farm products stabilisation accounts to be kept by the Marketing Department and provision made for consultation with various sections of the primary industries for any necessary price adjustments to meet increased costs.

With our system of easy transfer of land increased prices are quickly reflected in increased land values, and there is no doubt that the passing of the Servicemen's Settlement and Land Sales Act, 1943, was of great importance in the policy of stabilisation. This very important Act deals with two distinct though related problems, the acquisition of lands for soldier settlement and the control of land sales. The sensitivity of land values to an expectation of increased prices of farm products or indeed to inflationary finance is notorious; the land boom in 1920 is a case in point, as is also the land boom in the seventies. With the present abundant purchasing power, the restricted market for many commodities, and the demand for land for soldier settlement, it is at once apparent that land values would have risen to very inflated values without this act. (1).

Butter and Cheese

In the three seasons preceding the war (1936-37, 1937-38, and 1938-39) production of creamery, whey, and farm butter averaged about 164,900 tons; export accounted for 136,400 tons and local consumption for 28,500 tons. In the same period cheese production averaged 88,300 tons; export accounted for 84,600 tons and local consumption for 3,700 tons. During the war an increase in cheese manufacture was first undertaken and then a change was made back to butter. Because of the possibility of a shortage of refrigerated shipping, a survey was carried out in September, 1939, to measure the possibility of making more cheese and less butter. In June, 1940, a second survey was carried out following the receipt of a request from the United Kingdom Government for an increase of 15,000 tons of cheese at the expense of butter and subsequently a request for the greatest possible maximum production of cheese; after investigation this possible production was placed at 165,000 tons. To enable this change-over to take place it was necessary to direct (Dairy Supply Control Order, 1940) suppliers to change over from the supply of cream for buttermaking to the supply of milk to cheese factories. It was also necessary to provide the cans and transport for handling the whole milk, the necessary vats and other appliances at factories, and houses for workers. This entailed between 1940 and 1942 an additional 2 million ton freight miles in cartage, the provision of 13,000 milk cans, 139 cheese vats, the equipment of 23 buildings as

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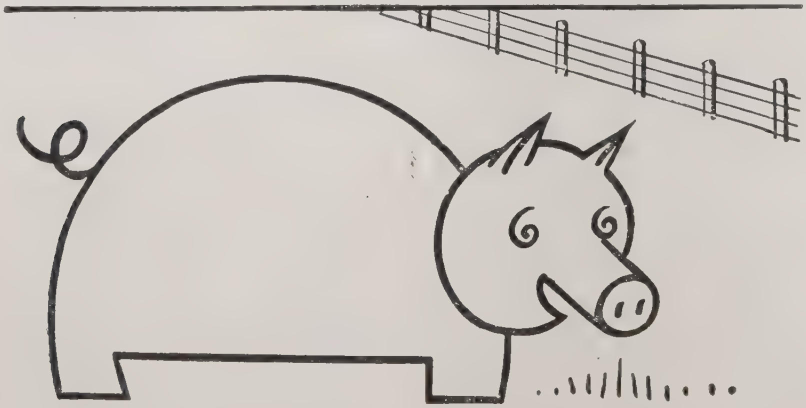
(1) "Land Legislation in New Zealand," F. R. Bray, Journal of Agriculture, September, 1945.



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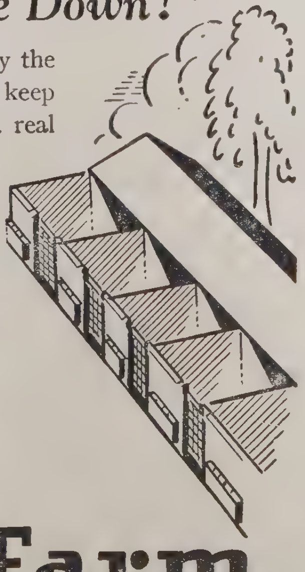

cheese factories and the working of double shifts at 72 factories, as well as making important demands on the Department's staff in the work of grading, supervising the change-over, and payment of subsidies. The responsibility for the cost of the equipment required was accepted by the Government and amounted to £94,000. In the change-over the numbers of suppliers and cows involved were as follows:—

	Suppliers.	Cows.
1940-41	1,850	92,500
1941-42	4,318	181,000
	6,168	273,500

In 1942 a change was made back to the manufacture of butter and the Dairy Supply Control Order (July, 1942) required all suppliers changed over to cheese under the 1940 and 1941 orders to revert to the supply of cream.

Dehydration was used to find a way for the disposal of whey and second-grade creamery butter which were excluded from shipment in the earlier years of the war, and in the 1941-42 season a contract was made for the supply of 10,000 tons of dehydrated butter. A plant under the direction of the Internal Marketing Division was in operation for the greater part of the 1942-43 season and was able to treat accumulated stocks of whey butter of the 1941-42 season and also whey and second-grade creamery butter produced in the 1942-43 season. During the 1942-43 season 2,980 tons were manufactured and a request was made by the United Kingdom Government for the erection of plants to dehydrate 35,000 to 40,000 tons per annum. This request was later annulled, and with subsequent improvement in shipping whey and second-grade creamery butter were included in the United Kingdom bulk butter purchases.

The manufacture of butter and cheese during the war has been as follows:—

	Total butter. Tons.	Total cheese. Tons.
1939-40 ..	161,000	97,800
1940-41 ..	167,800	122,400
1941-42 ..	135,900	157,400
1942-43 ..	144,000	101,700
1943-44 ..	139,500	91,700
1944-45 ..	158,500	104,000

Dairy cows in milk in the 1939-40 season at the outbreak of war numbered 1,740,000; the highest figure during the war was reached in the 1940-41 season, with 1,780,000 cows in milk. Numbers subsequently dropped to 1,669,000 in the 1943-44 season, and were estimated to be 1,700,000 for the 1944-45 season. Considering the labour and fertiliser shortages, it is really remarkable that the dairy industry has maintained such a high level of production during the war.

Meat

The Dominion produces about half a million tons of meat annually, of which about 65 per cent. is exported and 35 per cent. consumed locally. Omitting offals, the average production for the three seasons immediately preceding the war was 456,800 tons (offals amount to 14,000 to 16,000 tons per year and are included in the total meat figure (470,000 tons) in the table in the first section), and in the following seasons production (omitting offals) has been as follows:—

	Tons.
1939-40	519,000
1940-41	502,000
1941-42	520,000
1942-43	521,800
1943-44	493,000
1944-45	522,000

The proportionate production of lamb, beef, mutton, pig-meat, and veal is shown in the following table, which details the production for the 1942-43 season (ended September 30) :—

Class of meat.	For export. Tons.	For local use. Tons.	Total * produced. Tons.
Beef ..	87,500	84,800	172,300
Mutton ..	53,200	61,800	115,000
Lamb ..	162,600	9,900	172,500
Pig-meat ..	14,300	27,200*	41,500
Veal ..	14,400	6,100	20,500
	332,000	189,800	521,800

* Abnormally high; usually about 20,000 tons.

The main features of the meat industry during the war have been the ready clearance of much of the heavy-weight mutton and second-grade beef, which was an embarrassment in the immediate pre-war years, the increase in canning, the development of a dehydration plant, the control and rationalisation of the buying of fat stock, and the variation of weight schedules and prices to conform to the demand for heavier slaughter weights.

Canning and dehydration of meat helped to conserve meat which otherwise might have been wasted during periods of acute shipping shortage. Early in the 1940-41 season it became obvious that New Zealand should assist in the disposal of meat available for export by canning to the maximum of existing plants and should also extend canning facilities. Contracts for the supply of canned meat were arranged with the United Kingdom Government and later with the United States Joint Purchasing Board. A meat dehydration plant erected at the request of the Ministry of Food came into operation in March, 1943, and ceased production in September, 1944.

The meat industry has definitely expanded during the war: sheep numbers are higher than they have ever been and the only decline has been in pig-meat production, which is mainly accounted for by labour difficulties on dairy farms and certain other factors which are worthy of reference, as they illustrate some of the difficulties experienced in the war production of foodstuffs.

At the commencement of the war the United Kingdom Government agreed to purchase all New Zealand's exportable surplus of meat products, but until the occupation of Denmark by Germany there was no exceptional demand for pig-meats. When Denmark was occupied the United Kingdom requested increased production from New Zealand. Producers responded by increasing their output to over 1,005,000 carcasses in 1941, compared with the 872,000 carcasses of the previous season.

At this stage, because of the necessity of conserving shipping, an effort was made by the United Kingdom to secure such increases as were necessary from Canada and the United States of America, on account of the much shorter haul. Consequently the New Zealand Government was informed that the export of pig-meats from New Zealand was no longer required by the United Kingdom, and the industry was advised to this effect. Again, the change-over from butter to cheese in the following year and the change back again 12 months later from cheese to butter—in compliance with the British Government's requirements—gave a general feeling of instability and uncertainty to the pig industry. These unavoidable factors

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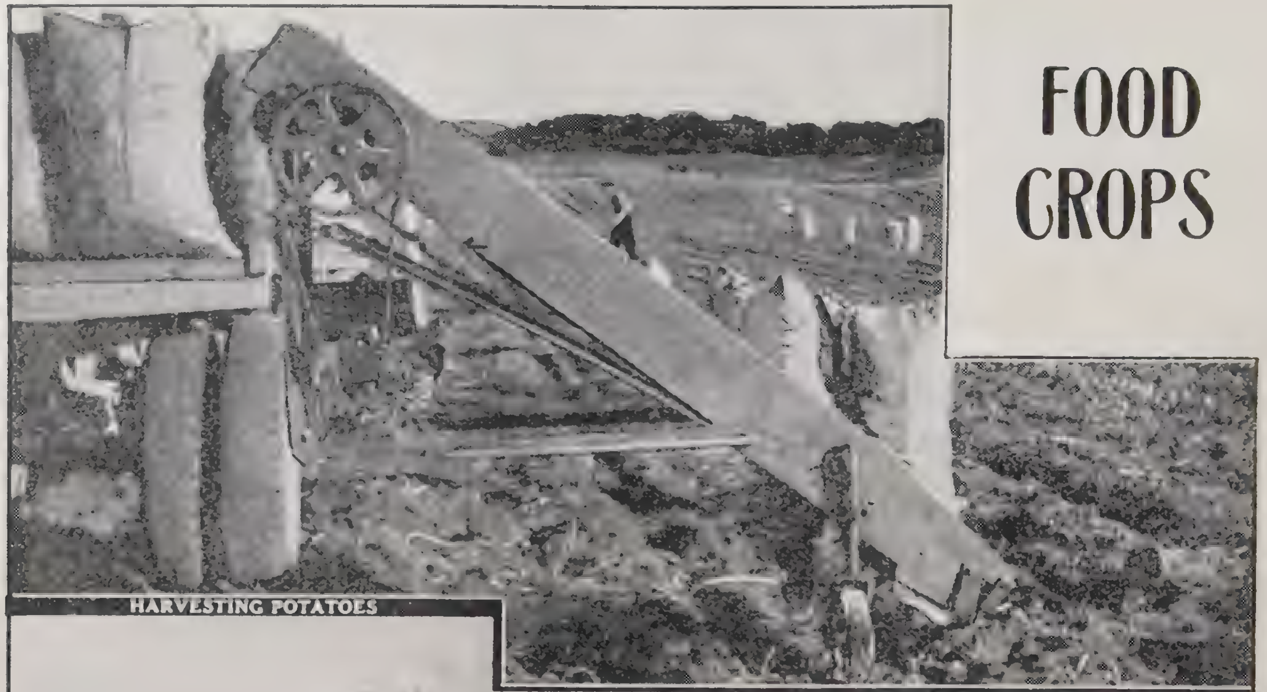

HARVESTING POTATOES

HARVESTING PEAS

STORING ONIONS

With the entry of Japan into the war attention had to be paid to increasing production of food crops. The pea acreage was raised from 19,000 to 45,000 acres, potatoes from 15,000 to 30,000 acres, and onions from 900 to 2,000 acres.

were caused solely by the development of the war situation.

With the spread of the war to the Pacific a revision of the policy was again necessary, and the industry was advised that there was an urgent and very substantial demand for pig-meats. However, it was not easy to recover lost ground. Producers had withheld sows from the boar, with the result that production fell in 1942 to 926,000 carcasses, to 767,000 in 1943, and to the low level of 741,000 for the season ended September, 1944.

Another factor affecting the industry has been the general shortage of labour on farms, coupled with the unfavourable seasons in many parts of the Dominion. This led to a limitation of winter feed supplies, which resulted in the inability of producers to carry the usual supply of store pigs through the winter.

In order to arrest the decline in pig production the schedule for pig-meats was increased, and an effort was made early in 1943 to import feed from Australia to make good the deficit caused by local drought conditions. Shipping difficulties delayed the arrival of these essential feed supplies until they were too late to affect the position. In the following year drought conditions in Australia debarred New Zealand from obtaining any stock feeds from this source, and this led to the introduction of the £5 per acre crop subsidy scheme for winter pig feed. To assist further the fulfilling of contracts to the United States Joint Purchasing Board a prohibition was placed on the sale of fresh, frozen, and cooked pork in 1942, and a ceiling was placed on the civilian consumption of bacon. All bacon-curers were registered, and a sales quota was established for each curer. The price of pigs was fixed by regulation, and this necessitated the introduction of a quota scheme for the disposal of bacon carcasses among operators, to ensure that each curing establishment received sufficient pigs to fulfil its contracts for pig-meats to the United States Joint Purchasing Board for the Allied forces in the Pacific.

The weight ranges and schedule prices for pigs have been subject to several alterations. In 1943 schedules were increased for both pork and bacon, and a winter price was brought into force, operating from June to October inclusive, which further increased the price for all pigs during this period, to give encouragement to producers to carry more pigs during the winter.

Early in 1944 the weight range for all pigs was again altered, to give greater coverage, porkers being accepted from the low weight of 40lb. The schedule for baconers was raised to include weights up to 200lb. Under normal trading practice carcasses under 60lb. or over 170lb. are not desirable for local or export requirements, but the serious decline in pig-meats made these alterations necessary, in an endeavour to increase the tonnage of pig-meat produced.

These measures have been responsible for an increase in bacon pigs, killings of which are nearly twice those of the pre-war period, so that, on a tonnage basis, the decrease is not so serious.

Meat inspection is one of the important duties of the Department of Agriculture. During the war the United Kingdom Government insisted on the maintenance of pre-war standards of meat inspection, and when the United States of America entered the war and supplies for troops in the Pacific war zone were obtained from New Zealand a similar standard was rightly demanded. This threw a big strain on the meat inspection staff, but the position was met by the acquisition of a "wartime staff," all of whom performed their important duties in a particularly satisfactory manner.

Wool

Wool production has increased during the war; for the three seasons immediately prior to the war the average greasy wool production amounted to 309 million pounds, and thence rose as follows:—

Season.	Million lb.
1939-40	310
1940-41	332
1941-42	345
1942-43	340
1943-44	330
1944-45	350

Prior to the war local woollen mills used only about 7½ million pounds of wool, but during the war consumption reached 16½ million pounds.

The wool industry was not in a particularly buoyant position in the immediate pre-war years and a Royal Commission on the sheep-farming industry was sitting when war broke out. Immediately war was declared Great Britain agreed to purchase the whole of the Dominion's wool clip for the duration of the war and one season thereafter. The price to be paid to the grower was fixed at an overall average price of 12.25d. per lb. for greasy wool. To implement this agreement the appraisement scheme was immediately got under way, which had a precedent in the "Commandeer" Scheme, 1916-1920. During this period the necessary details had been worked out and thoroughly tested, so that a minimum amount of trial and error was required on the present acquisition of the New Zealand clip by the United Kingdom.

A staff had to be found at very short notice to carry out the valuing or appraisal of the whole clip and the clerical work connected with it.

Shipping and storage of wool have presented many difficulties, and at present there is an accumulation of wool in this country amounting to approximately 370,000,000lb.

Sheep farmers are now assured of a continuation of the Appraisement Scheme and present prices for the 1945-46 season. After that the new Joint Organisation Scheme is to come into operation with the object of disposing of the present large accumulation along with new clips as they come to hand each year. The aim is to stabilise prices by fixing a

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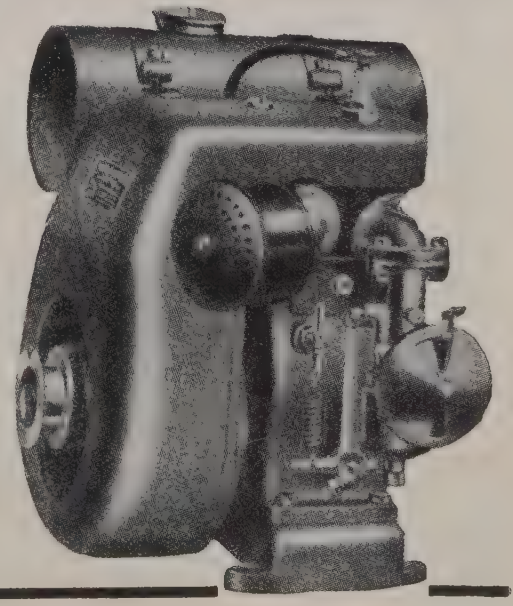


FIBRE CROPS

Linen flax was first grown on a commercial scale in 1940-41 as the result of an appeal from the United Kingdom Government when Eastern Europe was invaded. At the peak of production 20,000 acres were under linen flax and 17 factories were in operation.

Production of *Phormium tenax* was stepped up after Japan's entry into the war. Production of fibre in the early years of the war was about 3,500 tons, but was raised to 5,700 tons in 1944-45.

Upper—Harvesting linen flax.

Lower—Phormium fibre.

minimum reserve below which wool will be withdrawn from the market. Assuming reasonable stability in the price levels of commodities generally, wide fluctuations both during the season and from one season to another can be avoided by the general measures of adequate offerings and reserve prices. It is expected that it will take 12 to 13 years to clear all surplus stocks.

Cereal and Pulse Crops

In the five pre-war seasons the average area under cereals and pulse crops for threshing was 326,000 acres, while in the first five war years the average was 384,900 acres. New Zealand is not self-supporting in cereals, and apart from wheat the Dominion annually imports considerable quantities of barley, maize, pollard, and bran for stock feeding, the quantities being 30,000 tons in 1938, 50,000 tons in 1939, 42,000 tons in 1940, 23,000 in 1941, with a drop to 20,000 tons in 1944. The lack of adequate supplies of grain and concentrates for stock feeding necessitated the introduction of rationing and the granting of priorities to essential users.

AREA UNDER CEREAL AND PULSE CROPS FOR THRESHING.

Crop.	Average of five seasons 1934-39. (acres)	Average of five seasons 1939-44. (acres)	Forecast 1944-45 season. (acres)
Wheat	214,200	255,900	184,000
Oats	63,400	57,700	50,000
Barley	22,400	30,000	36,000
Maize	6,900	8,100	5,000
Peas and beans .	19,100	33,200	45,000
	326,000	384,900	320,000

Wheat acreages in the five pre-war seasons averaged 214,000. Increased production occurred in the first five war harvests, varying from 233,000 to 287,000 acres. The area for the 1945 harvest dropped to about 184,000 acres, and less is anticipated for 1946. These decreases are primarily due to adverse weather at sowing time, and necessitated large imports during 1945, and the same position is likely to occur in 1946. Increased prices have been paid for wheat as costs have risen. One interesting feature of wheat production during the war has been the wide use made of header harvesters in reducing the labour requirement for harvesting.

In the five pre-war seasons the average area in oats for threshing was 63,400 acres, and during the war the area fell to 40,000 acres in 1944 and 50,000 acres in 1945. Shortage of feed oats in 1944 led to importation from Australia, but the position is now reversed, with surpluses available here for export. The area under oats for chaff has also declined over the last 10 years.

Oats are grown for milling and for horse and stock feed, and one of the reasons for decline in oat production has been the mechanisation of farming. The use of horses is declining and agricultural tractors are increasing at the rate of 3,000 per annum.

The fixation of prices for oats has proved difficult. The price of milling oats has been controlled, but feed oats and chaff have been left free, for it is very difficult to fix a standard for feed oats and chaff.

Barley is grown for brewing and for feed, but production in the Dominion is normally below domestic requirements. The average barley area for the five pre-war years was 22,400 acres for threshing, and during the war it has risen as high as 37,000 acres. Prices for barley are controlled.

In the five pre-war seasons the average area of maize for threshing was 6,900 acres: it rose to nearly 11,000 acres in 1941, but since then has fallen to below 6,000 acres. Prices have been controlled in the last two to three years. Supplies have been very limited and in 1944 amounted to only about 25 per cent. of our requirements, and distribution has been controlled through the maize-marketing committee.

The average area in peas and beans for threshing in the five pre-war seasons was 19,100 acres, and during the war has risen to 45,000 acres. The major increase has been in Blue Prussian peas, upon which heavy demands have been made for canning for the American forces and for export. Increased demands have also occurred for garden varieties and Partridge peas. Prices for peas have been uncontrolled and have increased appreciably over pre-war prices.

Linen Flax

Linen flax was first grown on a commercial scale in 1940-41 as the result of an appeal from the United Kingdom Government when Eastern Europe was invaded. Linen flax production was a remarkable undertaking: in the first season 12,000 acres were grown and 11 factories established to process the crop. All the machinery was made in New Zealand and the staff had to be collected and instructed in their work. In the following season 22,000 acres were grown and 17 factories operated. In the last two seasons the acreage has fallen to about 10,000 as the need for fibre became less urgent.

With the end of the contract with the United Kingdom in sight, plans are now being laid to change over from a Government-operated industry to a Public Utility Corporation operating seven of the most efficient factories and growing up to 8,000 acres to produce sufficient fibre and tow for New Zealand's spinning requirements.

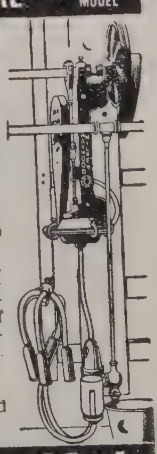
Surpluses of seed led to the establishment of an oil extraction plant and this has resulted in an increase in the acreage of linseed for seed. The Dominion is now self-supporting for its linseed oil requirements.

Phormium Tenax

On the entry of Japan into the war supplies of hard fibre (manila and sisal) were practically cut off and attention had to be given to the full use of *Phormium tenax* for the making of ropes for the Royal New Zealand and United States Navies operating in the Pacific. Up to that time only enough flax was being milled in the Dominion to supply the local market, and steps were immediately taken to increase output. A subsidy of up to £1 per ton on green leaf was given to millers to enable otherwise uneconomic stands to be cut and processed. At the same time the Government opened two mills, one at Westport and the other at Kerepehi, to help supply increasing quantities of fibre. Production of fibre in the early years of the war was about 3,500 tons, but was raised to 5,300 tons in 1943-44 and 5,700 tons in 1944-45.

Seeds

Before the war the Dominion had a considerable export trade in grass and clover seeds, but was dependent on imports for most of the fodder crop and garden seed requirements. Rape, kale, soft turnips, and swedes are very important fodder crops in the Dominion, and annually half a million acres are sown in these crops. The possibility of war cutting off seed supplies was foreseen and steps taken to provide as far as possible for the Dominion's requirements. Prior to the war all swede and turnip seed



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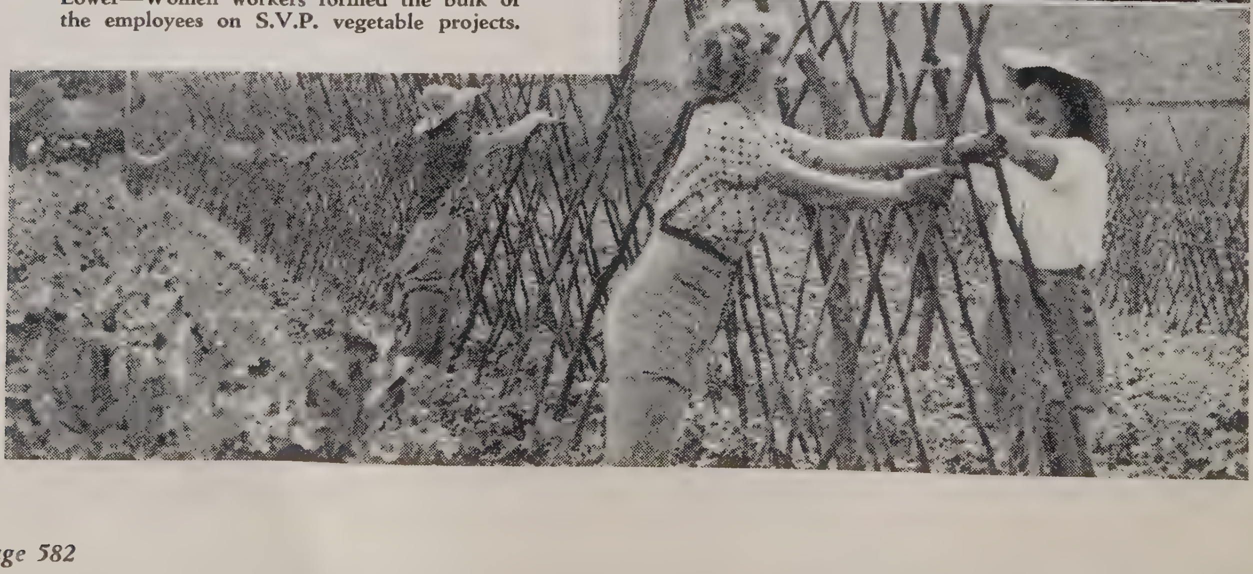
LABOUR

Shortage of labour on farms, which was a limiting factor in production throughout the war, became acute soon after Japan's entry. Army labour was used for cereal and hay and silage harvesting work and women workers played a large part in the vegetable and fruit production programme.

Upper left—Army harvesters making silage.

Upper right—The American Army helps to harvest cabbages.

Lower—Women workers formed the bulk of the employees on S.V.P. vegetable projects.



was imported from Great Britain, and with the threat of supplies being cut off the Department of Agriculture took steps to ensure that sufficient seed was produced locally to meet our requirements. This necessitated the commencement of virtually a new industry worth about £20,000 a year to the growers. The selection work necessitated in raising parent stocks has been undertaken by the Department, which has also supervised the growing and distribution of the seed. Results to date indicate that with only four years' experience the quality of the seed is at least equal to that of imported lines. Chou moellier and kale seed have been raised on similar lines to swede and turnip seed.

Before the war a programme of rape seed production under Departmental certification had already been commenced, though half our requirements were still imported from Great Britain. Since the war we have produced more than enough rape seed for our own needs and have actually exported up to 300 tons in one season to the United Kingdom.

The production of grass and clover seeds has long been an important industry in the Dominion. The trade in seeds has been greatly improved since the introduction of the Department of Agriculture's certification scheme. During the war increased demand has arisen for these seeds from the United Kingdom, and in the last two seasons it has been necessary to introduce temporary export embargoes on certain items to ensure that the Dominion's local requirements were satisfied. Prices have not been controlled and the increased demand has caused them to rise sharply. Production of white clover seed has doubled during the war, and there has been a considerable increase in production of red clover seed. Exports to the United Kingdom have greatly increased and very favourable reports have been received of the behaviour there of certified lines. It is hoped that this export market of grass and clover seed in the United Kingdom can be retained and expanded in the post-war years.

Most of the vegetable and flower seeds required in the Dominion before the war were imported from U.S.A., Europe, and Australia. During the war imports had to be supplemented by Dominion-grown seed, and credit is due to the organisation of Dominion seed production. Domestic production of vegetable seeds now amounts to 222,000lb., while the import requirements are 122,000lb.

Potatoes and Onions

The Dominion's annual domestic requirement of potatoes is about 20,000 acres, and in the five pre-war seasons the average area was 21,900 acres. In the first two years of the war the area fell to 15,200 acres and a shortage resulted. After Japan's entry into the war the area under potatoes was increased each year, until in 1944-45 30,000 acres were planted. With unfavourable autumn weather in 1945 the yield from potatoes fell below expectations, and it has been necessary to import from Australia to supplement local supplies, but the quantity supplied to the United States Joint Purchasing Board this season is in excess of the quantity now being imported.

The area under onions was increased considerably towards the end of the war, and the estimated area for 1944-45 is 2,000 acres. The average area for the five pre-war seasons was 800 acres and for the first five war years 900 acres.

Vegetables

The shortage of labour during 1941-42 caused a scarcity of vegetables just at the time when demand was greatly increased. To supply the vegetables for civilian and military requirements the Government undertook vegetable production on leased land under the Services' Vegetable Production Scheme and encouraged commercial production by arranging contracts.

The Services' Vegetable Production Scheme utilised labour which could not be employed by commercial growers: women workers, very few of whom had had any experience, formed about half of the employees and a great deal of the harvesting was carried out with school children labour. The scheme was initiated in the winter of 1942 and all projects will be closed in the autumn of 1946. Over 5,000 acres were leased, of which 4,200 acres were cultivated. Production for the three seasons 1942-43 to 1944-45 amounted to 50,000 tons of vegetables. Approximately 1,000 persons were employed on the scheme at its height, and in February, 1944, when work was at its maximum, 1,292 persons were employed, of whom 686 were males, 499 females, and 107 boys and girls. This Services' Vegetable Production Scheme was worked under very great difficulties, but fulfilled its purpose and provided large quantities of much-needed vegetables.

Commercial vegetable production also increased by 4,000 acres during the war and growers increased by 600. The present acreage is 21,000 with 2,900 growers. Expansion of commercial production has coincided with the easing of the labour position, the tapering off of S.V.P. production, and the increased demand for vegetables for dehydration and shipment to the American forces in the Pacific. Production for these purposes was secured by contracts arranged with the growers by the Internal Marketing Division.

To supply the demands of the American forces in the Pacific processing plants in the Dominion were greatly enlarged. Five dehydration plants were erected, canning facilities extended, and packing sheds erected to crate vegetables for export in a fresh condition under cool store. Most of this wartime processing plant will not be required in the post-war years.

Fruit

There are approximately 20,000 acres devoted to fruit growing in the Dominion, and the average annual production of all fruits is approximately as follows:—

2,250,000 bushels of apples,
250,000 " " pears,
650,000 " " stone fruit,
75,000 " " lemons,
60,000 " " other citrus, and
1,460 tons of berry fruits (raspberries, loganberries, strawberries, passion fruit, etc.).

The loss of the export market for apples and pears at the outbreak of war created a difficult marketing problem. Whereas prior to the war about 1½ million cases of fruit were exported annually and 1 million cases sold within New Zealand, with war conditions the whole of the crop had to be marketed within New Zealand. The Government arranged to purchase the whole apple and pear crop, which after inspection by officers of the Department of Agriculture was taken over by the Internal Marketing Division for distribution and sale. Prices have been controlled for apples and pears and most kinds of stone fruit. With the demands of the Joint Purchasing Board since the entry of Japan into the war and the poor supply of Island fruit, all locally-produced fruit has been absorbed. Large quantities of apples have been dehydrated. Like the primary industries the fruit industry has had many difficulties to face during the war such as shortage of fertilisers, labour, and other requisites, but production throughout the war has been well maintained.

Poultry Industry

The maintenance of a satisfactory level of egg production during the war has been a very difficult problem. Eggs are produced by many types of poultry keepers, ranging from the suburban resident who keeps a few fowls and the farmer who keeps larger flocks to the commercial keeper who relies on the sale of eggs and breeding stock and table poultry for his living. No figures are available of the poultry population since the Census in 1936, but it is certain that numbers fell considerably in 1941 and 1942 due to shortage of labour both on commercial poultry and other farms. At the same time increasing quantities of eggs were required to meet both an increased civilian demand due to increased purchasing power, and the demands of the Armed Forces. The increased demand for eggs led to severe marketing problems, for with the price of eggs pegged at 1939 prices, eggs were diverted from the organised markets. Various steps were taken to improve the position: owners of large flocks liable for military service were held on appeal; loans were granted for the extension of poultry plants; an increase of 2d. per dozen on the wholesale price of all grades of eggs was permitted for the minimum price period during the "flush" season of eggs, and priority was given to poultry keepers to secure essential goods such as building materials and wire netting.

In addition, a substantial grant was made to Massey Agricultural College to expand their poultry plant and a similar grant was made to Lincoln College to establish a poultry department. Both grants were made to encourage increased production during the war and to afford improved poultry training and research facilities after the war.

In June, 1944, a subsidy of 3d. per dozen on all eggs passing through organised and approved egg floors was granted—partly to encourage increased production, but also to attract eggs to these floors by offsetting the increased price obtained by producers when making "gate sales." During the 12 months following the granting of this subsidy an additional 3½ million dozen eggs passed through the normal distributing egg floors as compared with the previous 12 months, and so helped to alleviate the marketing position to an appreciable extent.

Thus as a result of the increased egg production campaign and the increased price paid for eggs, there were marked indications of a revival in egg production. Unfortunately coincident with this revival came the Australian drought and the cessation of all supplies of poultry food from that country. This has caused a severe shortage of poultry food in New Zealand and has automatically slowed down the expansion of the poultry industry for the time being. Nevertheless, an improvement in the egg supply position has so far been maintained.

Before the war no organised table poultry production existed in New Zealand and table poultry sold to the public, much of it inferior in quality, was largely cull poultry from commercial farms—a by-product of the industry. With the entry of America into the war and the arrival of American troops in New Zealand there was an immediate increased demand for table poultry of a higher quality than previously obtainable. At the request of the United States authorities the Government established a table poultry plant for the production of small prime chickens which were processed and packed to American standards. In addition, the United States Joint Purchasing Board called for other classes of table birds, again of an improved standard and processed to their requirements. This has so far had a good effect upon New Zealand producers in that steps have already been taken in a number of centres, including Auckland, Wanganui, Hastings, and Christchurch, to process and market a better-class bird.

Honey

The beekeeping industry also has suffered from labour, transport, and other difficulties during the war. There are over 6,500 registered beekeepers in New Zealand with about 130,000 registered hives. The industry's production fluctuates from season to season, but is in the vicinity of 3,400 tons of honey and 102,000lb. of beeswax. Under the marketing plan set up by the Government in December, 1938, a packing and sales depot was established for the voluntary use of beekeepers, and this scheme succeeded in stabilising the market for the sale of honey in the Dominion. During the war beekeepers have been obliged under the Honey Emergency Regulations to supply a certain percentage of their crop each year to the central depot to meet wartime priorities.

The End of the War

Much essential farm maintenance work was not carried out during the war because of shortage of labour and materials. Fencing, drainage, scrub cutting, and noxious weed eradication are among the jobs which will require urgent attention as soon as labour and materials are freely available.

The control of soil erosion and hill-country pasture deterioration will have to receive urgent attention. Fertilisers will have to be used more freely on hill country, for the maintenance of our hill-country pasture is very important to the meat industry, as the extensive pastoral farms supply the fund of breeding and store stock which the intensive grazier uses for breeding and fattening stock for export.

Although certain rehabilitation work is necessary, the Dominion farming industries are in a sound position at the end of the war, and given stability in prices and assured markets, our exports of primary produce will continue to expand.

◆

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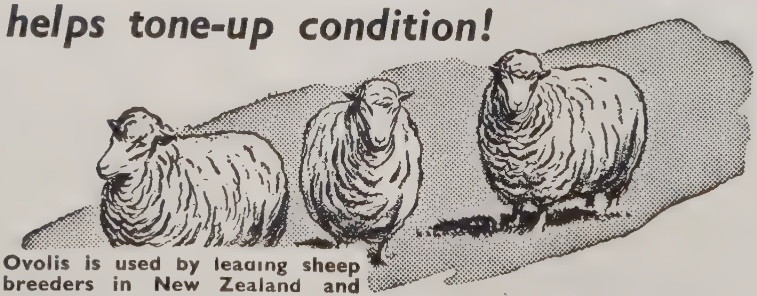

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Beekeeping on the West Coast

By

A. T. MYERS,
Apiary Instructor, Greymouth.

A well-kept apiary at Kelly's Creek, Westland, showing bush-clad hills in the background.

WHILE some districts in New Zealand, although a considerable distance apart, may experience somewhat identical conditions such as honey flora, honey flows, and weather, others, such as the West Coast of the South Island, experience conditions almost entirely their own.

BEEKEEPING is carried on both domestically and commercially from Karamea in the north to as far south as Okuru, Turnbull River, a distance of approximately 300 miles, the average width of the district being about 25 miles. The Southern Alps form a natural boundary on the eastern side, with the sea coast to the west.

With the exception of a comparatively small extent of cleared river flats, the remainder of the area comprises steep and hilly to mountainous bush-clad country, including a fair amount of what is known as "pakahi" land. The main sources of nectar are therefore among the native bush, rata trees being the most predominant, with kamahi (birch) affording an excellent supply of nectar for the building up period in the spring. In contrast to most other districts, white clover is found only in limited quantities.

A hardy young West Coaster handling a comb of bees.

Other valuable nectar-secreting flora include the following:—Fuchsia, wineberry (*Aristotelia*), native holly (*Olearia*), lawyer, rata vine (red and white), ribbonwood, koromiko, rangiora, cabbage tree, and flax, in addition to numerous others of minor importance. Blackberry, from which a good flow of nectar is usually obtained, is to be found in abundance growing on wastelands, the honey being white in colour and of good quality.

The annual rainfall is in the vicinity of 100in., the greater portion falling during the spring and early summer, while the winter is usually colder and somewhat drier. It is not uncommon to notice a slight flow of nectar being gathered from the rata vine on fine sunny days during the winter. Fuchsia and lawyer begin to bloom as spring arrives, followed by wineberry and native holly, and early in November rangiora and cabbage trees, etc. Towards the end of November kamahi is usually blooming profusely. Commercial beekeepers take advantage of this flow of nectar to have comb foundation drawn out before the main honey flow, as the honey from this source has a strong, bitter flavour, but is ideal for bee feed and the secretion of wax by the bees for comb building. During this flow one is frequently able to detect the strong scent of the honey in the apiary without even opening a hive.

Rata Honey

The first rata bloom may be observed during December, beginning on the low country near the sea coast and gradually extending to higher country with the advancement of the summer. With the start of this flow the bees appear to abandon other sources of nectar, apparently realising that less effort is required to gather the large globules of nectar protruding from the nectaries of the flower. One has only to shake the branch of a rata tree in full bloom and notice the shower of nectar to realise the quantity secreted by this tree. In a reasonably good season it is not unusual for strong colonies to produce up to 200lb. of honey or more from this source. Unfortunately, so many seasons of recent times have been unfavourable that crops have been no greater and sometimes much less than those obtained in other districts.

Rata honey is water-white in colour in liquid form and white when granulated. As it contains a high percentage of dextrose and granulates very quickly, it should be removed from

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the hive and extracted as soon as possible, especially at the close of the season; otherwise it will begin to granulate in the comb, which makes the work of extraction difficult.

In certain localities a complaint known as "spring dwindling" is experienced in some seasons which is attributed either wholly or partially to a shortage of pollen in the hive, for although there may be flora available from which pollen could be obtained, the weather may be too wet and cold to permit of its being gathered by the bees, thereby causing a deficiency or total absence of pollen, so vital as a food for the raising of young bees.

Throughout the West Coast extensive areas of shingle heaps left in the wake of gold dredges are now becoming covered with gorse and broom, which provide an appreciable supplement to pollen supplies. Another plant valuable to the beekeeper which is becoming established on the dredge tailings is *Lotus major*, which yields a moderate flow of nectar of fair quality.

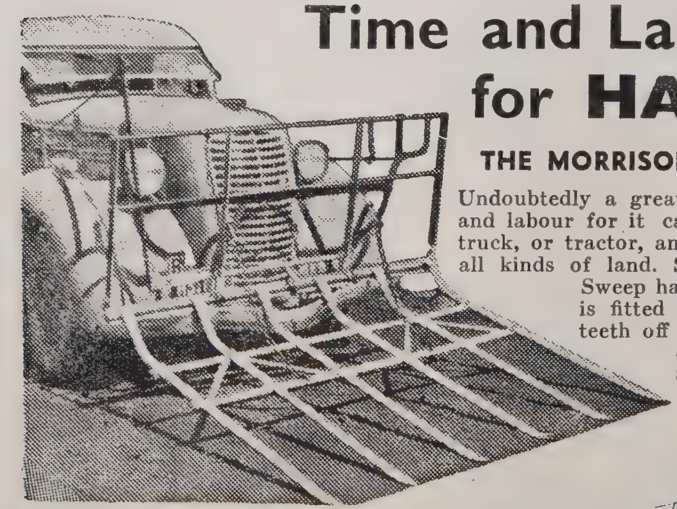
With the presence of wild bees in the bush, the control of disease on the West Coast calls for greater vigilance by the beekeeper.

Suitable timber for the manufacture of hives and frames is available throughout the district from many established timber mills, but the ultimate cost is not much lower than in other districts due to greater distances of transport and comparative isolation of commercial beekeepers. Another factor affecting any appreciable gain in lower timber prices is that owing to the continued wet weather hive material depreciates much more rapidly than in districts with a lighter rainfall.

During the early gold mining days on the coast practically every other miner owned at least one of the once-popular, but now illegal, inverted "gin case" hives in an endeavour to supplement the provisions of the household. The bees kept were the common black or German bees, which swarmed regularly and were the basis of the present large bee population in the native bush. With modern methods of beekeeping now practised, a growing preference for the Italian race of bees is in evidence, although some beekeepers still own and prefer the blacks. Owing to the frequent unsettled conditions during the spring and early summer it is difficult to secure consistently good results in queen rearing, with the result that many queens do not get mated and become drone layers.

While beekeepers in white clover districts must aim at having their colonies at peak strength just as the main flow begins, it is often noticed that a much weaker colony on the West Coast will return quite a substantial crop of honey due to the nectar flow from a variety of sources being of longer duration. It is common to see any number up to 200 colonies in one apiary yielding a good average crop per hive, but in recent times the rata trees appear to be fast disappearing, with a consequent drop in the colony crop averages and a steady reduction in the carrying capacity of each apiary. Owing to the intensity and duration of the main honey flow during good seasons and distances of transport, combined with the large number of colonies kept at each apiary, most beekeepers maintain an extracting plant at each of the larger apiaries. As electric power is not universally available, petrol engines provide the motive power for extracting purposes.

In conclusion, it must be emphasised that anyone contemplating taking up commercial beekeeping in any particular district should give very careful consideration to every aspect of conditions likely to be encountered, especially as to whether the district is already fully stocked with bees.



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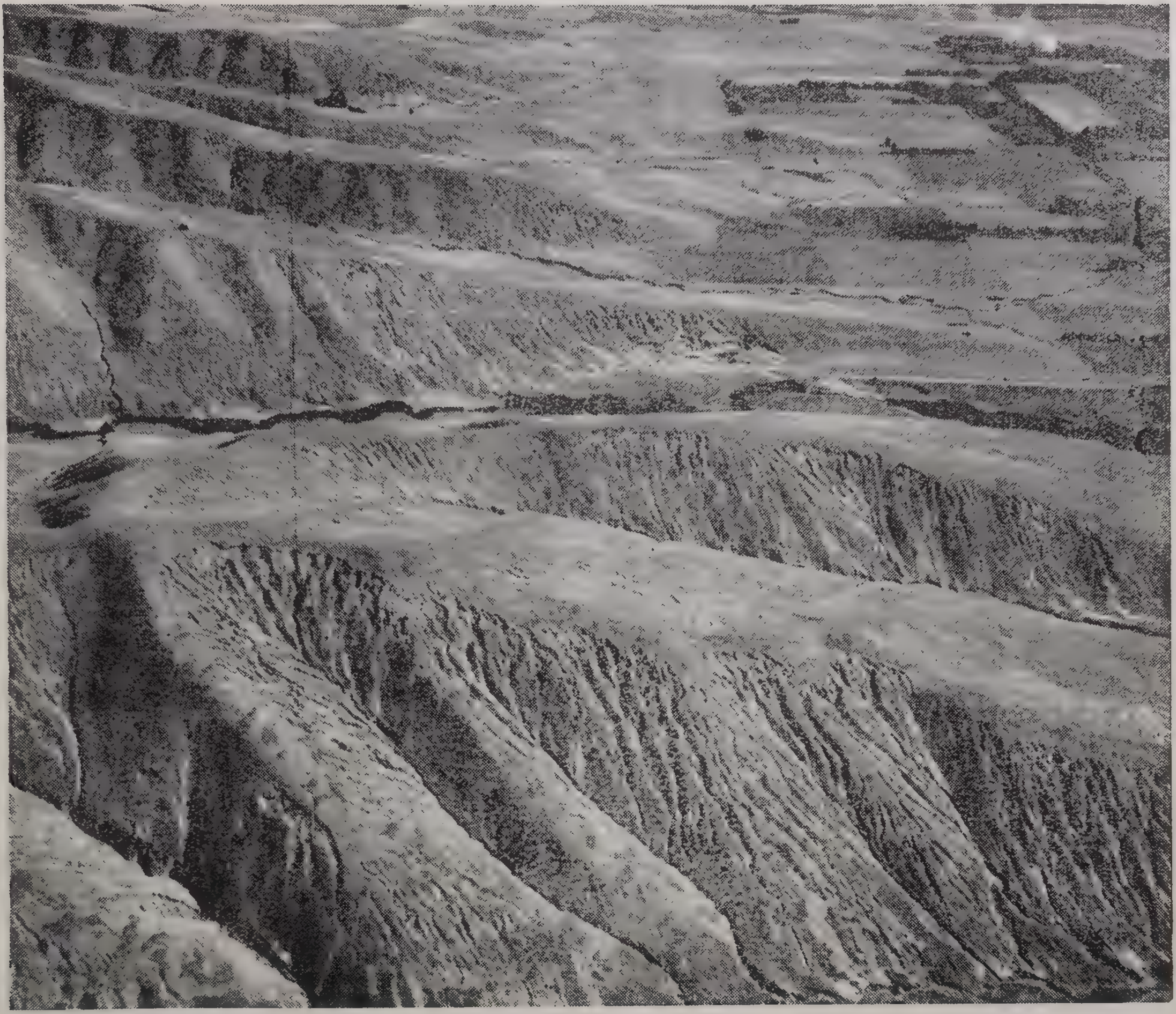

[N.Z. Aerial Mapping photo.

Soil Erosion

WHILE much of the publicity given in recent years to the problems of soil erosion may have been pessimistic, and New Zealand as a grassland farming country may not be liable to the soil disasters which have overtaken other countries, it is well to realise that mistakes have been made in this country the repetition of which can be prevented and the remedies found only by the encouragement of an already apparent public soil conservation mindedness. This article by J. E. Bell, Land Utilisation Officer, Department of Agriculture, Wellington, and D. A. Campbell, Technical Officer, Soil Conservation and Rivers Control Council, should do much to place the question in its right perspective.

AFTER expressing in no uncertain terms the folly of living in cities and the useless lives many city folk live, Weston Martyn, in his novel, "The Wandering Years," makes the following observations—

> *Man must eat or die. His food comes from two sources only, the soil and the sea. If there were no soil, there would be no men. Modern man's great mistake is the belief that there is plenty of soil and that it is permanent.*
>
> *The truth is, soil is a mere skin, a few inches thick, existing on a surprisingly small proportion of the earth's surface. This thin, unstable, and comparatively scanty skin on which man's existence depends takes centuries to form, but can (and does) vanish utterly in the space of one storm of wind or rain, if subjected to a decade of tillage. And supremely unsuitable tillage is precisely*

NATIVE VEGETATION

BUSH

GRASSLAND

SWAMP

what most of the soil of the world has been subjected to for the last ten decades.

Facts are facts, even if hard-headed city-bred business men do not see them. The best way to make them see is to speak in their own jargon. For the last ten decades, at least, man has been living on his capital. He has exploited the world's virgin soils. . . .

A period of high and easy living has resulted from man's exploitation of the soil; but now all that is coming to an end. . . . The over-exploited soil is losing its power to produce food. More serious still, the stability of the soil in the "new" countries has been destroyed. It is soil no longer; it is dead dust. A storm of wind, a torrent of rain, and even that dust vanishes. . .

Laugh those facts away, my hard-headed business man! The prime producer's day is dawning. Do not deceive yourselves. When there is not enough food to go round, it will be useless to offer a man shares in the Bank of England for a share in his potato crop.

While these remarks in the novel "The Wandering Years" and in similar vein in other books in recent years make us soil conservation minded, we must not view the position too pessimistically. Much of the soil in the world, notably in northern and mid-Europe, and on New Zealand's top-dressed rolling grasslands, has been well conserved, and man must see that the good practices there continue and are also employed to hold soils in all other parts of the earth.

We know that soil is the nation's most precious heritage, that it takes many years to build up soil, and if it is destroyed or lost, the loss in many cases is irreparable. Civilisation first appeared in regions where soils were stable and highly productive. Thus the earliest known centre of civilisation, the Nile Valley, owed its appearance and continued existence to the Nile River and its delta of rich soil. The same can be said for the early appearance and continuous existence of civilisation in China along the Yangtze Kiang River and the Hwang Ho, and in India in the Ganges Valley. Civilisation also made a very early appearance in the valley of the Tigris and Euphrates. This latter civilisation, however, did not last, because, it is conjectured, the soil became infertile, either through nomads destroying the irrigation system or through the soil becoming poisoned by accumulations of salts from the irrigating waters. The civilisation along the Hwang Ho, or China's Sorrow, as it is sometimes called, is threatened by the deforestation of the hills of yellow loess through which the river runs before it reaches the Great Northern Plain of China. The river consequently has to carry large quantities of water laden with spoil from the denuded hills every time heavy rain falls in the highlands. This results every few years in large-scale flooding of the plains in North China. The civilisation of the United States is also threatened somewhat by soil loss arising out of careless over-cultivation of rolling country and lack of control of the rivers in the Mississippi basin. However, during the last few years a programme to prevent further soil erosion and to control the rivers has been under way, and the work done in Tennessee, where the rivers have been harnessed to supply power and water for irrigation, has partly overcome the problems, and this work has met with the admiration of the world.

Land Use in N.Z.

In New Zealand the public and farmers have lately been made fully aware of the dangers of soil erosion to our economy and to our existence as a civilised nation. We have also been made aware of the damage which has occurred, and it is useful to study briefly the changes which have taken place on the land prior to and during the occupation of the country by the pakeha. Historical accounts frequently refer to the dense, impenetrable nature of the forest, the jungle-like nature of the swamps, and the dense rank growth of the grasslands studded with spear grass and dotted with patches of wild Irishman. Prior to the advent of man, except on the seashore, riverbeds, and steep rock faces, Nature did not fail to provide protective vegetation adapted to local needs. These protective plant associations had been built up since long before the beginning of recorded history. In that period countless generations of plants had lived and died, returning quantities of organic matter to the soil, which was thereby deepened and enriched and enabled to grow plants which produced increasing amounts of dead vegetation.

The natural vegetation which the white man found on his arrival in New Zealand could not entirely serve his needs. The great open grasslands of the South Island were developed quickly and easily, for they gave quite fair grazing for sheep, especially if burned for the production of fresh growth. Burning was also necessary to destroy wild Irishman. After burning, the flat and gently sloping land was readily ploughed and cultivated for wheat and other crops and the sowing of grass and clovers more suitable for livestock. Burning soon enveloped the adjoining scrub and bracken fern country, which was surface sown with English grasses and clovers to provide grazing. After the smaller trees and scrub were felled burning proceeded in the forest country, particularly in the large areas in the North Island, which were then converted to surface-sown pasture lands. During development in both islands extensive fires swept the hills, and the resultant pall of smoke often blotted out the landscape for days. Ever-expanding flocks and herds pushed the frontiers of grass further afield to poor, less accessible land, on to steep unstable soils and to high altitudes. On the arable land intensive cultivation and cropping were often practised with straw crops such as wheat until declining yields

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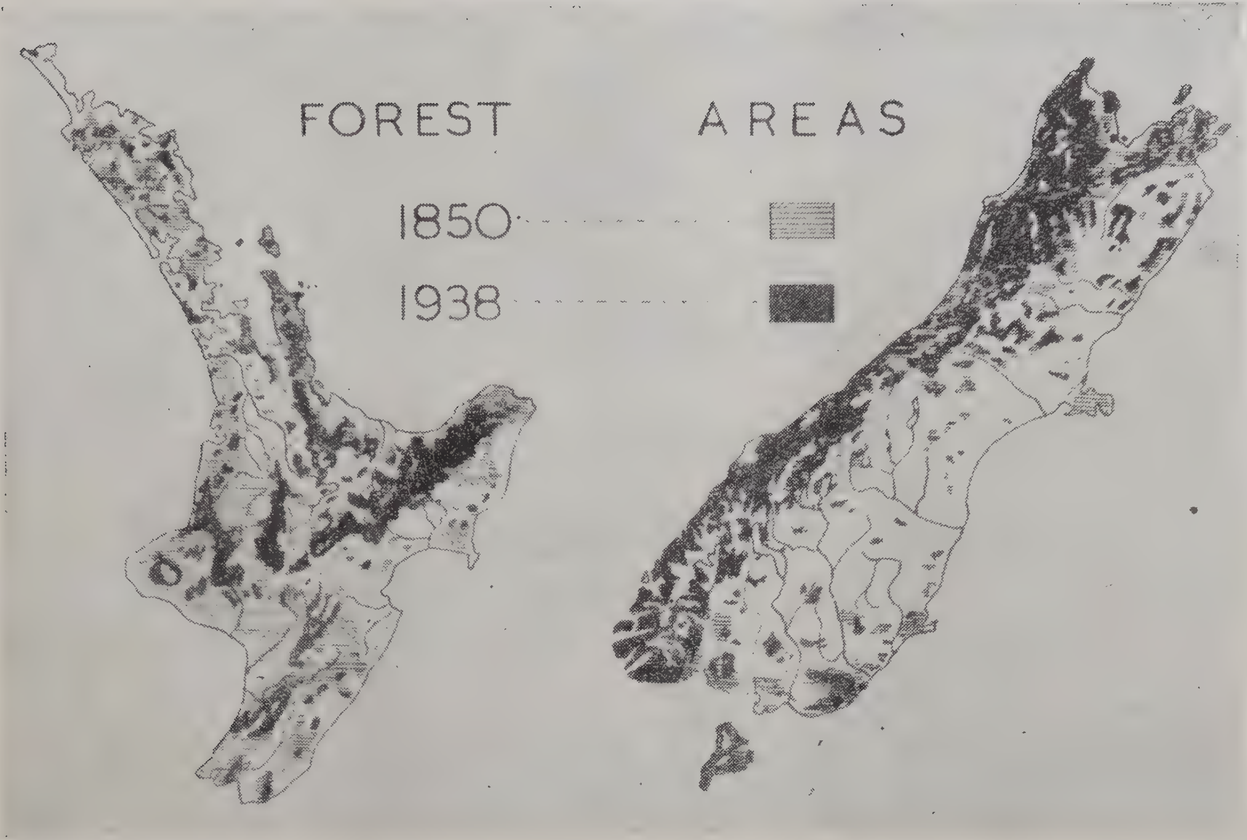
SHEET EROSION

WIND

WIND AND WATER

WATER



[Map by courtesy of Internal Affairs Dept.

forced the adoption of rotational cropping, including resting periods in pasture.

In the deterioration of the hill-country grassland that followed no doubt much over-grazing occurred, because of a natural reluctance to reduce stock numbers and the need of heavy stocking to prevent reversion to fern on the previously bushclad hill country.

The history of land use could well be written in terms of the severity with which burning, grazing, and cultivation were used in various areas. The depletion of much of the tussock grassland of the South Island provides irrefutable evidence of ruin by excessive burning and over-grazing by sheep and rabbits. Large areas of abandoned hill country in the North Island likewise bear mute testimony to ill-conceived attempts to grass and farm country climatically unsuited or too steep for that purpose. The damage to the ploughable country, while it went far enough, was checked by better farming methods, which, however, need to be reviewed and improved.

Deterioration Leads to Erosion

The deterioration that followed on both native and introduced pastures on the hill country led to a thinning out of the sward and to patches of bare ground, which without its protective cover was readily eroded by frost, wind, and rain. Prior to the appearance of the firestick, sheep, and rabbits the soil had been protected as well as it could be by Nature. After the advent of the white man and while the pasture was growing luxuriantly and the stumps of trees remained it was fairly well protected. When, however, the pasture became weak it began to suffer from sheet erosion, gullying, slipping, and slumping of the soil.

TYPES OF SOIL EROSION.

The common concept that soil is a permanent natural resource capable of indefinite production is unfounded and dangerous. There is convincing evidence in New Zealand and from numerous countries overseas that soil wears out at a rate that corresponds with the ill treatment it receives.

Normal geological erosion has slowly fashioned or sculptured the hills and valleys by gradual denudation during the course of millions of years with the tools of gravity, wind, water, frost, and sunshine. The process slows down progressively as the elevations are reduced and the hills and valleys become more rounded and of gentler slope. The rate of denudation has been progressively slowed down by an increasingly protective cover of vegetation and soil, the accretion of which more than compensates for normal losses by erosion.

The delicate balance between the rate of erosion, the climate, the vegetation, and the soil is easily upset in the more critical habitats. When the vegetation is damaged or removed the soil becomes increasingly exposed to frost, wind, rain, and sunshine, with the result that its removal is accelerated beyond the rate at which it is formed. Such losses of soil are termed soil erosion.

Unwittingly man has, by his efforts to discipline the land, created conditions favourable to the loss of soil by soil erosion. By clearing, burning, grassing, and stocking hill country and cultivation of rolling country the soil has been consolidated and its organic matter content partially exhausted. So often these changes have been accompanied by a decline in fertility, a corresponding depletion of plant cover, and an increase in exposed soil.

When soil is no longer protected by litter and vegetation and held in place by surface roots it becomes an easy victim to the active natural agents of

GULLY EROSION

erosion—rain, running water, frost, and wind.

Sheet Erosion

The surreptitious removal of layers or sheets of soil from the surface is the least readily detected and usually the most serious form of erosion on farm lands. The best soil is slowly and continually removed in this way by wind and water. In some cases it is easy to ascertain whether wind or water has been responsible, but in many cases both agents have played an important part in the removal of the layer of soil, particularly from the steeper slopes in various parts of New Zealand. Frost plays a conspicuous seasonal role in disintegrating and pulverising exposed soil to prepare it for removal by wind or water.

(a) Sheet Erosion by Water:

The degree of consolidation and kind of soil structures are important factors in the rate at which rainfall is absorbed by the soil. Thus tramping and cultivation affect the rate of run-off of the water, which, as it gathers momentum down the hillside, carries increasing amounts of soil. Fields cultivated to a fine tilth are particularly susceptible to this form of erosion, and there are numerous instances of this in New Zealand. The losses are less severe when the ground is lumpy or occupied by crops.

(b) Sheet Erosion by Wind:

Winds of sufficient velocity to remove dust, fine particles of soil, and sand are commonly experienced in New Zealand. The size of the particle and the quantity removed are largely conditioned by the velocity of the wind and the dryness of the soil, but conditions favouring the wholesale removal of soil from cultivated fields are by no means uncommon. This type of erosion occurs in fallow lands and has occasioned severe losses in the Canterbury Plains, in Hawke's Bay, and less frequently on pumice soils. Wind has also occasioned loss in Central Otago, where the scant vegetation has exposed the ground to the pulverising effect of frost.

Gully Erosion

Wherever the run-off of water is great enough and sufficiently concentrated gullying is liable to occur.

Small gullies and rills to the depth of the ploughing are obliterated by subsequent cultivation and soon forgotten, but the real damage done is not so easily repaired, and the soil is correspondingly poorer, because soil rebuilds slowly.

Larger gullies remain a monument to soil erosion, as they enlarge by subsequent scouring. Too often they are regarded rather fatalistically as unavoidable incidents in the development of the land, or as accidents caused by exceptional downpours of rain. They are essentially indicators of advanced erosion tnat follows in the wake of severe sheet erosion. Gullying of exceptional magnitude is common in soft shattered shales and papa in the Gisborne and East Coast area, where chasms up to half a mile in length several hundred feet wide and hundreds of feet deep have been carved since the land was cleared in the eighties. Gullies can be controlled by plugging them with trees and diverting water from them and keeping it spread out on the land, to avoid concentration and scour.

Mass Movement

The slow natural creep of soil on the steeper slopes under the influence of gravity is inevitable and accounts for the greater depth of soil at the base of these. This normal downward movement, however, is considerably accelerated by cultivation and movement of animals and plays an important part in the exposure of subsoil on the crests of steep slopes, particularly when sheet erosion by wind assists owing to lack of vegetation and binding roots.

The earth slip or debris slide is the most obvious mass movement in many parts of New Zealand, particularly on North Island hill country. These "slips" are usually shallow and not very extensive, while the material moves off to spill downhill in a discontinuous apron below the scar. Serious slipping coincides with heavy rains that follow prolonged spells of dry weather, which assist the development of cracks in the soil and subsoil.

Slumping is usually associated with deep-seated movements on structurally weak country made up of highly fractured mudstones and shales. Large blocks of earth slip or slump down with a certain amount of backward rotation, while the toe slides forward and often flows down the slope.

River Erosion

In New Zealand the more rapid run-off from hills, with an increased load of soil and debris and the drainage of areas which once temporarily stored flood waters, has contributed to the overloading of rivers, which, as the result of such conditions, are liable to scour, and overflow and inundate valuable farm lands.

PREVENTION OF SOIL EROSION IN N.Z.

In this country we are fortunate that our main crop, permanent pasture, is a protective one as far as erosion is concerned. The better and thicker the sward of grass and clover the better the protection it affords.

On steep slopes it is very difficult to prevent the soil slipping, whatever the vegetative cover, as on hillsides pasture swards are liable to be thin and open and not

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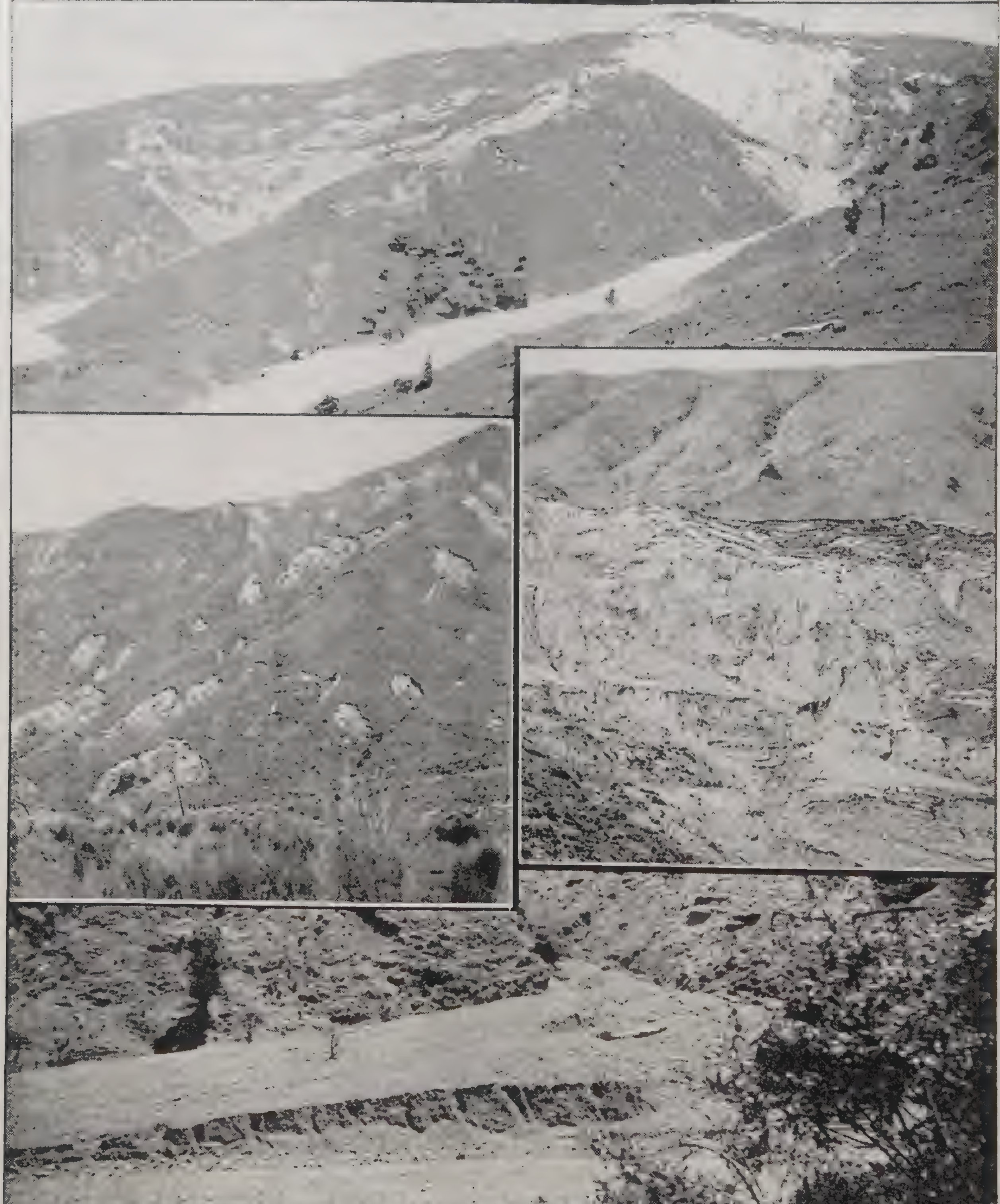
MASS MOVEMENT



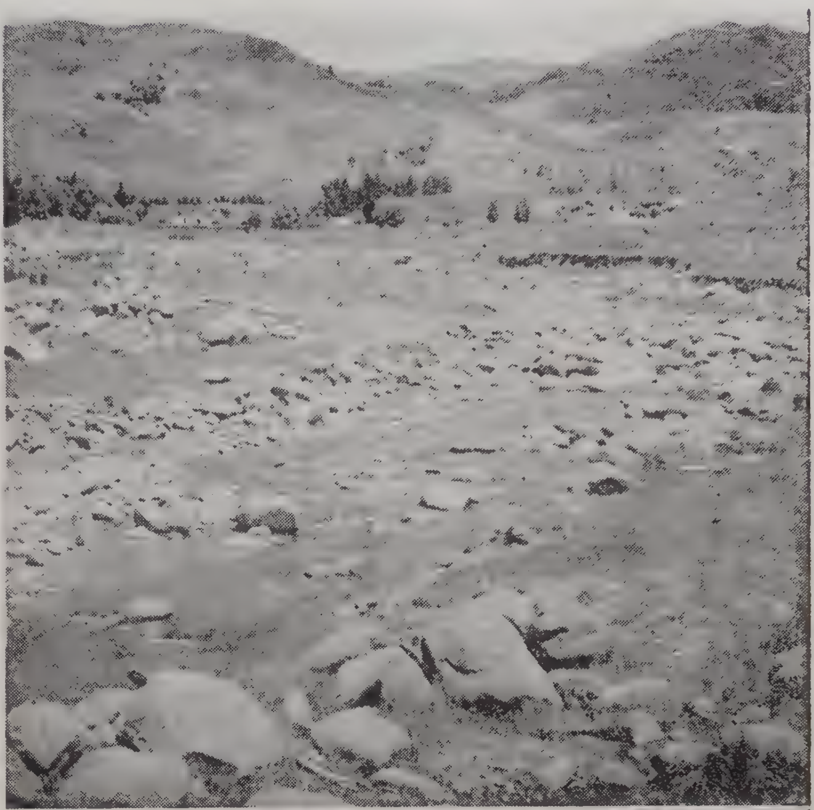
efficient in preventing erosion. If such country is allowed to revert to scrub, all slipping is not prevented by any means, and trees, though more efficient, still cannot entirely prevent slipping. Scars show that slipping occurs, even in our native bush, although through the rapidity of soil formation the loss is made good.

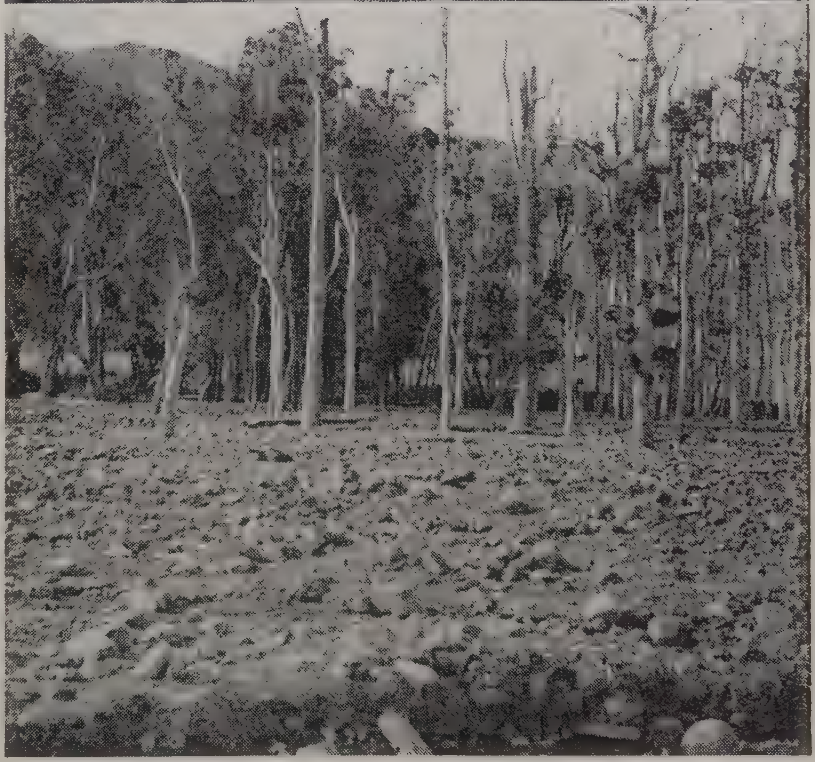
Cover is really all important, and the more efficient the cover the more stable the soil will be. To mitigate against soil erosion on steep country it is necessary either to encourage the growth of a thicker sward of grass or to allow it to revert to scrub and native bush, or to plant trees.

The kind of programme which should be pursued depends largely on soil type. On some country, such as papa country, the subsoils are fertile and scars are rapidly healed and become again clothed in pasture. On other country the subsoil is so infertile that it cannot be farmed economically, and the scars do not regrass. On the former country grassland farming should continue, while on the latter when or before the land reaches the uneconomic stage it should be retired from farming, and permitted to reheal its scars in the absence of livestock.

It is to the more fertile hill country that attention should be immediately turned. It is well worth saving and the difficulties there are not so great. The soil must be held as stable as possible. It has already been mentioned that a thick sward of grass is more effective in preventing soil erosion than a thin sward; it is also more productive. On many of our hills the pasture consists of thin swards of danthonia or tussocks. These conditions have arisen through hard and continuous grazing with sheep and rabbits, abetted on many farms by fire. Arguments do arise concerning which is the worst enemy, sheep, rabbits, or fire, but there is little doubt that they all contribute their quota. The evil of fire on the danthonia pastures of the North Island appears to be fully realised, and the burning of these pastures nowadays is practised to a very limited extent. It may be necessary on occasions to burn to destroy seedling manuka, but it should not be practised to provide fresh green pasture growth. Burning destroys clovers and the better grasses and therefore makes it more difficult to bring about that desirable thick sward. Rabbits are not a great problem in the North Island. In the South Island rabbits are much more prevalent and the burning of tussock country is practised to a larger extent because of the poor palatability of this plant and the

EXAMPLES OF RIVER EROSION





great need to provide additional feed. After burning, a forced growth of young green shoots is produced. The punishment of fire plus the forced production of green shoots which are rapidly eaten weakens the plant. In some areas the plant has died and without its protection the palatable undergrowth has disappeared, leaving a desert of rock and wind-eroded soil partly clothed by scabweed.

Grassed Hills once in Bush

The problem of obtaining a thicker sward is fairly easily solved in the North Island to the ultimate economic benefit of the farmer. It certainly involves a period of poorer returns, which may be made short and fairly drastic or of longer duration and not drastic. It involves the running of less sheep and more cattle.

Pastures grazed with cattle must be permitted to grow fairly long and not grazed close, to encourage the growth of better species such as cocksfoot and clovers. During the period of improvement the returns are bound to be lower, but as the carrying capacity of pastures improves the sheep numbers may be increased, and it is possible to increase them above the original carrying capacity as well as to continue to carry larger numbers of cattle.

To obtain the best results the property requires adequate subdivision, and the fields should be grazed in rotation with the cattle in one mob; it is probable, too, that better results will also be secured if the sheep are placed in large mobs and graze the fields in rotation also. If any particular field requires speedy improvement, it should be grazed for a period with cattle only, but the normal method would be to graze the sheep behind the cattle. Cattle cannot be expected to effect much improvement if they are spaced thinly all over the property and have to compete with sheep for the hard-grazed grass.

Improved and thicker swards can also be obtained in moist climates by topdressing. Unfortunately, however, this is not yet practicable over large areas of hill country. The great difficulty is not so much the spreading of the fertiliser as the carting of it to the area to be topdressed. The difficulties of using aeroplanes for this work were outlined in an article by A. M. Prichard which appeared in the February, 1945, "Journal of Agriculture." It must be remembered, however, that air sowing of fertiliser is as yet in its infancy, and the aeroplane as a means of transport is improving rapidly in efficiency; so the time may not be so very far distant when the problems of economical transport and application of fertiliser to hill country will be solved.

Tussock Grassland

Improvement of the tussock hill country of the South Island is a much more difficult problem. The first settlers found millions of acres of this grassland running the length of the South Island ready for depasturing their sheep.

The flat and rolling country of Canterbury, Otago, Southland, and Marlborough was ploughed and grew crops of wheat, oats, barley, and fodder. It was then sown in English grasses and clovers. The unploughable areas, however, were not disturbed, and for the last 80 to 100 years have carried large flocks of merino and merino crossbred sheep.

The grassland consisted of tussocks growing in clumps that sheltered the finer grasses and herbs growing between, which provided the bulk of the feed for the sheep. The runholders, however, soon found that the tussock provided a fresh, green, palatable growth after burning. The tussocks were burnt in the early spring (August to September) to produce greenfeed for the breeding ewes at lambing time. In those days the efficiency of a farmer was gauged largely on how much burning he carried out to provide ewes and their progeny with greenfeed in the spring. Some considered that at least a third of a property should be fired each year to meet the requirements of the ewes. This system of farming so weakened the tussock that in large portions of the drier areas it has been

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Native vegetation preserved on hillsides prevents erosion and provides shelter and protection to pastures.

eliminated. Following weakening or death of the tussock the numerous smaller grasses and herb species which existed between the tussock clumps were exposed to the full drying effects of sun and wind and died. This left no vegetative cover, and plants such as scabweed, which could stand the dry conditions, invaded these areas.

In Central Otago, where the soil, though rich in minerals, is low in humus and powdery, extensive wind erosion followed destruction of the vegetative cover and resulted in exposure of subsoil and rock, particularly on north-west faces. On the steeper areas, following weakening of the vegetative cover and with the assistance of frost, scree slides have formed, which develop into long bare slopes of loose subsoil and irregular stones.

In other areas the amount of erosion is less dependent on the maintenance of the tussock, which can be considered the mother plant of the montane tussock association.

Rabbits assisted the sheep to destroy the frequently-burnt tussock, as the plant was given no opportunity of recovery from the burning, which in this pest's absence would have been possible with judicious stocking. The tussock caterpillar also assisted to destroy tussock which had been weakened by over-grazing.

To prevent further erosion on tussock lands it will be necessary to encourage the growth of vegetation of some kind. Where sufficient of the tussock remains it is possible to encourage growth of the original vegetation to reach a state when it is stable and can conserve the soil. To do this it will be necessary first to reduce the rabbit infestation, to restrict burning to that absolutely necessary, and, after grazing the green growth judiciously, to spell the burnt areas so that the tussock will completely recover.

This management policy may mean a reduction in carrying capacity for a period, and it will require further capital expended in rabbit destruction and in fencing for further subdivision of properties. It may be possible, however, to maintain stock numbers by better provision of winter feed grown on the ploughable country, utilising crops such as oats, turnips, and lucerne; and carrying capacity may be improved by rabbit destruction.

On the country where the tussock is sparse regeneration of the tussock cover is most difficult. Experiments in Central Otago show that there is more promise of obtaining a vegetative cover by the introduction of new plants than by regeneration of the tussock. The most promising so far are tall oat grass, lucerne, and cocksfoot. These experiments are still going on and new species are being tried out from time to time.

Control by Tree Planting

The thickening of the sward will not entirely prevent slips on much of the North and South Island country. To prevent this plants other than grass and clovers will have to be introduced on the areas where slipping is most prevalent. It is quite amazing to see how the planting of trees several yards apart will prevent the slumping of hillsides that are not too steep. Once trees such as poplars are established the ground between can still be used for grazing. Before taking this step, however, it is essential to stabilise the gullies, down which the streams will still continue to undermine the hillsides. The gully floors can be held by planting willows, but before planting it may be necessary to prevent the rush of water by erecting debris dams firmly anchored on either side. The height of the dams can be gradually built up as the floor silts up to the height of the dam. Once the floor is stabilised by planting attention can be paid to the sides and to the slumping ground above.

Use may also be made of aquatic grasses on the valley floors, and it is possible that these may play a great part in stabilising the valley floors and at the same time provide feed for stock. It is recognised that the planting of these grasses and willows may cause trouble in blocking the streams in the lower country, and the good they do in stabilising the soils in the high country should be measured against the harm that may be done below.

Control on Arable Land

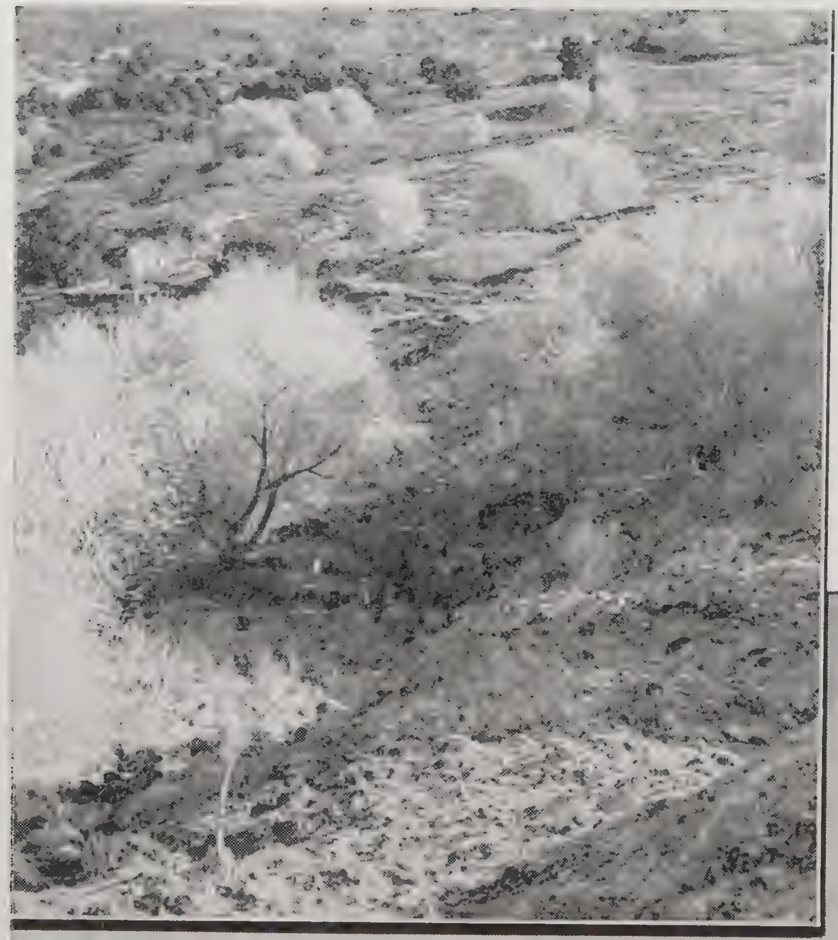
In a grassland farming country farmers are confronted only to a comparatively small extent with the evils of erosion on cultivated ground. Soil under cultivation moves very readily and erosion can be troublesome on quite gentle slopes which are under cultivation. Most of our fairly intensively-cultivated lands are situated on the plains, where there is little or no difficulty except for wind erosion, but there are quite appreciable areas of rolling country such as parts of South Canterbury under intensive cultivation which are subject to soil losses.

In the U.S.A. this is one of the chief problems. The methods adopted to meet the problem are contour cultivation, strip cropping, and contour banks. Contour banks are made by grading the soil into mounds running at right angles to the slope of the hill or in other words along the contour lines. These hold the descending water and, by thus slackening its pace, lessen scouring of the soil. Strip cropping obviates to a large extent the whole field being in fallow at the same time. It is during the fallow period and while the crop is establishing that the soil is most subject to wash from heavy and steady rain. If the whole field is lying fallow during this period, the soil loss may be severe, but if portions of it stretching across the field are in crop or cover crops, such areas act as a brake and prevent serious washing of the soil

PLANTING TO HALT EROSION

Left—Willows planted at intervals will stop mass movement through water erosion on hillsides.

Bottom—In Canterbury plantations of trees provide much-needed shelter and are an aid to the prevention of wind erosion.



down the slope. Moulded crops such as potatoes form a better barrier to the descending water if the rows run somewhat across the slope instead of straight down it. If fields are subdivided according to slope, it is easy to retire from cultivation fields that are too steep to cultivate even with the above safeguards.

SOIL CONSERVATION AND RIVERS CONTROL

The problems of river control, flooding, and soil erosion are not new. Efforts to cope with them have been made by the Public Works Department since its inception. Flood control work was first undertaken for the protection of engineering structures, and this was followed by channel improvement to give quicker discharge of flood waters and later by the building of stopbanks to prevent the spread of flood waters over valuable farm land. The first major scheme undertaken in 1912 by the Department and financed by the Government protected a large area of the Hauraki Plains from flooding by the Waihou and Ohinemuri Rivers at a cost of about £750,000.

Local bodies contributed varying proportions of the cost in the construction of schemes on the Taieri Plain, Heretaunga Plain, and on the Clutha, Manawatu, and Waimakariri projects.

It was realised many years ago that some of the problems were quite beyond the capacity and resources of local bodies, and in 1919 an Engineering Commission was set up to investigate and formulate general schemes for the control of certain large rivers; some of these schemes have been carried out.

In 1920 the Department of Internal Affairs drafted a Bill to meet the situation adequately with far-reaching legislation, but this Bill was dropped.

Unification of Action

About 10 years ago the Public Works Department was instructed to collect information to enable a long-term flood-control policy to be considered. Data on soil erosion and flood control collected by inter-departmental committees set up in various districts formed the basis of legislation passed by Parliament in 1941. This legislation co-ordinates all activities in controlling soil erosion and flooding, and brings about the essential unification of action, hitherto unattainable, of individuals, local bodies, and Departments in new and strengthened local bodies—the Catchment Boards—that are being set up by the Soil Conservation and Rivers Control Council.

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The first approach to the problem by the Soil Conservation and Rivers Control Council was a general appraisal of the position in New Zealand obtained directly by inspection.

Catchment Boards for local administration of watershed units have been set up in Hawke's Bay, Manawatu, Wairarapa, Nelson, North Canterbury, South Canterbury, Rangitikei, Poverty Bay, and Westland.

Research and demonstration projects are being planned with the co-operation of all State Departments interested—Agriculture, Lands and Survey, Public Works, Forestry, and Scientific and Industrial Research. Since its inception the council has made available to local bodies expert advice on river control problems and has subsidised river improvement and flood control work on all the major rivers in New Zealand.

The Act makes provision for the widest possible co-operation between State Departments, local bodies, and farmers, and it is the policy of the council to further these ideals and translate them into practice.

It is realised that all possible help and encouragement must be given to the man on the land, for the problem of conserving our soil resources must come down to the individual farm. A hundred years of trial and error methods have demonstrated wise and unwise land practices, and what should not be done has in so many cases been written indelibly on the land. We have learnt that it is urgent to conserve the limited areas of good land in New Zealand and to encourage protective vegetation on the remainder, and thereby help reduce the flood hazards of low-lying land.

Whatever the Cost

Since active soil erosion removes the soil itself, there comes a time when a compromise between production and permanence of the land becomes a national task. Whatever the cost, the permanence of the land is vital to the nation, even if treatment entails reduced production. No nation can afford to squander its top-soil.

We have learned in New Zealand that continuous cropping will lower the fertility of our best soils, but have failed to appreciate that over-grazing and regular burning of the unpalatable roughage will likewise ruin our natural and surface-sown grasslands.

Hill-country pasture lands play a prominent role in primary production and soil erosion and flood problems in New Zealand. The well-being of these large areas becomes a major issue of basic importance in our national economy. Modifications in the management of these areas to secure improved protective pasture by spelling, seeding, resowing, topdressing, and carefully-controlled grazing with a higher proportion of cattle are important preliminary steps. More adequate fencing, production of supplementary feed, and the protection and stabilisation of the steeper and more erodible slopes and gullies by tree planting and regeneration of natural cover are equally important in these regions. Every endeavour must be made to reduce burning to a minimum and to avoid over-grazing as much as possible, as these two factors appear to be the most devastating influences yet brought to bear on grasslands, whether exotic or native.

In many areas rabbits have made a disastrous contribution to the over-grazing of natural grasslands, and until they are brought under control regeneration is not possible.

The future well-being of New Zealand is intimately dependent upon fertile and productive top-soil; it is our greatest natural resource, upon which our prosperity and progress have been built. The present generation is charged with the responsibility of handing on this heritage to their children, in as good condition as possible, that they too may survive and prosper.

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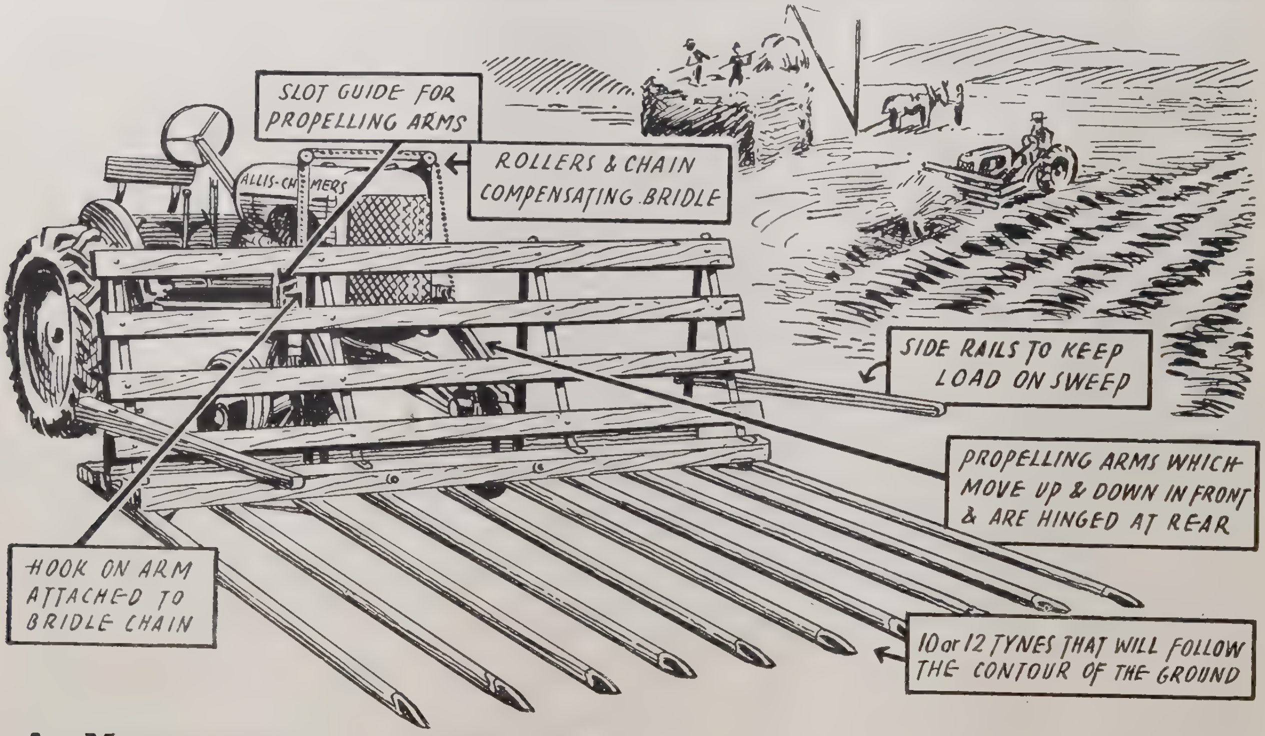
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FAT LAMB PRODUCTION

A Waikato Farmer's Methods

OVER the past five seasons the average weight of lambs sent to North Island freezing works has been 33.4lb. When a farmer who runs 1,200 ewes and up to 300 cattle with practically no assistance can average over 40lb. for this period it is apparent that his methods must have something to recommend them, and in this article A. T. Shannon, Field Economist, Hamilton, describes the sheep management on the Waikato fat lamb farm concerned.

SITUATED at Waikeria, about 10 miles south of Te Awamutu, on typical rolling Waikato country, the farm of Mr. W. B. Walker occupies 400 acres, of which 360 acres support a really excellent ryegrass-white clover sward. The other 40 acres are taken up by peaty and some undrainable swamp and are of little or no value for sheep grazing. This farm carries 1,200 Romney ewes and winters 160 to 180 2- and 3-year run steers, this number being increased to between 260 and 300 in summer by the addition of yearlings and some older steers. Shortly after the entry of Japan into the war Mr. Walker lost his assistant, and since then has had practically no outside labour on his farm, a position which called for careful organisation to maintain production.

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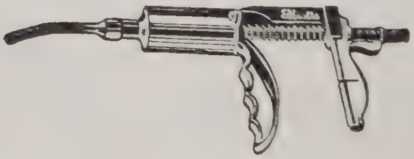

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The results of the management under these difficult circumstances are summarised in the table below from returns for lambs actually sent to the works in the past five seasons. An average of upwards of 50 annually accounted for otherwise are not included.

Season.		Ewes to Rams.	Lambs to works.	Down.	Prime.	Grading. 2nds.	Rejects.	Average weights.
								lb.
1940-41	..	1,294	1,305	1,211	74	12	8	40.5
1941-42	..	1,210	1,236	1,092	126	10	9	40.9
1942-43	..	1,200	1,192	1,125	58	3	6	40.6
1943-44	..	1,200	1,243	883	268	91	1	37.1
1944-45	..	1,200	1,309	1,255	51	—	3	43.4

NOTE: Of the total of 27 rejects in the past 5 years 10 were due to bruises in transport to the works. The lower percentage of lambs in 1942-43 was due to the fact that there was only about 70 per cent. lambing from 330 2-tooth ewes. Lower percentages were fairly general in the district that season.

Avoiding Peaks of Work

It was in 1940 that Mr. Walker decided to try to see whether, by going to a little extra trouble, it would be possible to have lambs grade well and weigh well over a period of years. The freezing figures tell their own story, and he is convinced that apart from dry seasons, such as in 1943-44, these results can be secured consistently. His aim in farming is to leave matters as far as possible to Nature and to avoid undue peaks of work. Accordingly no hay is made, and for the past three years there have been no swedes or other crops. The whole policy is to disturb lambs as little as possible consistent with correct and adequate feeding according to their size.

Previously about 10 acres of swedes were grown and fed off in June and July, the ewes close to lambing being picked out at intervals and put on to grass to avoid, as much as possible, any lambing on swedes. Since then, and as the labour question arose, the lambing has been rearranged by putting 400 ewes to the ram on February 15, 500 on March 1, and the balance of 300, normally 2-tooths, on March 20. The ewes are freshened, if this is at all possible, though it is not planned necessarily to set out and flush them. An average lambing results in between 105 per cent. and 110 per cent. actually sent to the works. Lambing commences about July 17, but by putting the ewes to the ram in batches there is less of the usual rush of lambs and the situation can be better handled by one man on his own.

The particular soil type lends itself to this policy. Known as the Otorohanga silt loam, it is "of volcanic shower origin and is fairly retentive of moisture, especially as consolidation proceeds. Just as there is no main peak of lambing, the actual fattening is accordingly also spread so that six to nine drafts are got away. This is valuable in easing the pressure on grass in dry years, and again is part of the policy of not having rush periods of work. Possibly 1,500 ewes might be carried on this farm, but lamb weights would be lower and one man alone could not handle the ewes efficiently. A study of the financial side suggests that net returns are quite as high now as would be the case if a further 300 ewes were carried and additional labour employed.

Lambing Policy

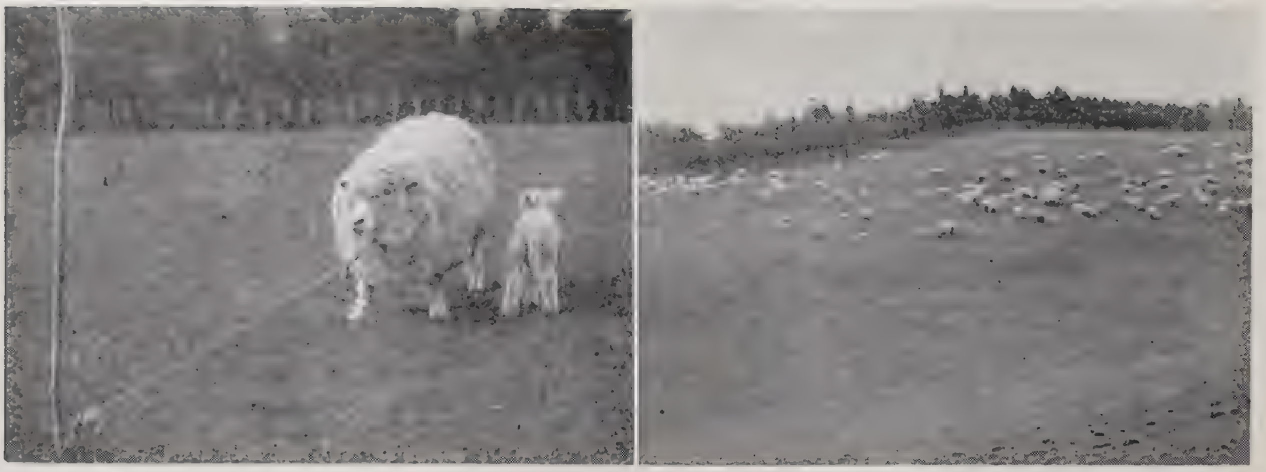
When the first lamb appears all the ewes are yarded and marked in stages of lambing; the 300 earliest, then the next 300 or so, and the balance are left for a further drafting as they get closer up. This makes the work of looking after them much easier. After about 100 ewes have lambed the balance are driven off and the twins are then drafted out. All twins are marked, each pair with its own special brand, so that the two can be paired at any time and it is easy to notice any straying. Incidentally, marking fluid is used in preference to raddle, which is not easy to use on wet lambs. The fluid is carried around in a small screw-top bottle with a marker attached inside the metal lid, and the job is very quickly done.

Lambs that persist in straying are tied together by thin strong string looped loosely around the necks and tied with a bowline knot. Experience has shown that twins must be tied together as close as possible to reduce the risk of casualties; with a foot or so between them there is a liability of death from hanging. A few are hanged each season, but very few. When first tied the lambs struggle for a time, but they soon settle down and the string is removed after about a week. Where a ewe is the cause of the trouble in getting separated from her lamb her front legs are tied together with a leather thong to slow down her movements for a few days.

Mothering up gets its share of special attention, and 5ft. sticks are placed all over the lambing paddock before the sheep come in so that the mothering ewes can be tied to them instead of being dragged to a distant fence. These ewes are tied around the neck and the first foot of the 5ft.

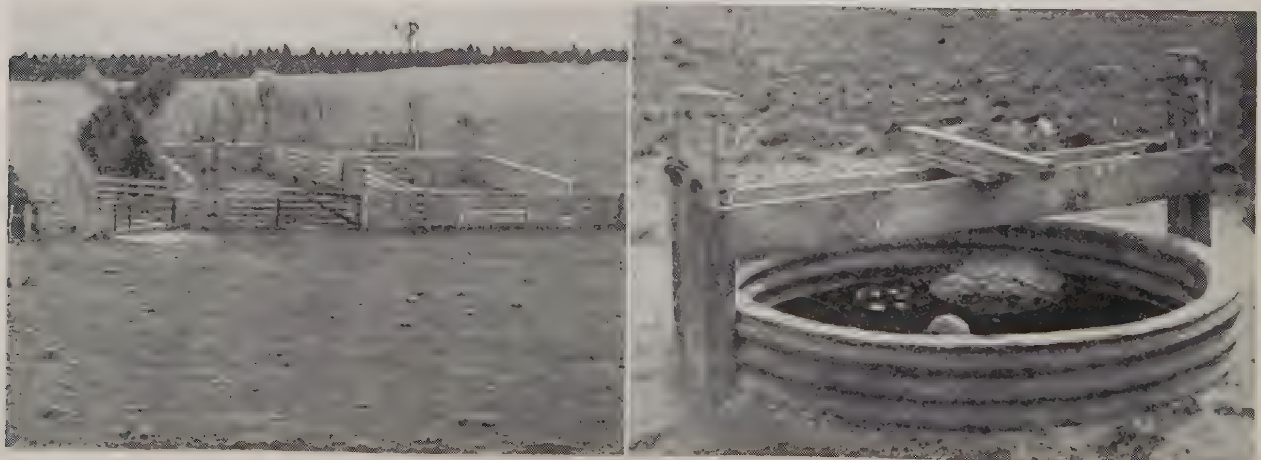
TWIN LAMBS

Upper—Straying twin lambs are tied together with thin string in loops big enough to slip over the lambs' heads. Lower—Tied twins go in to drink both from the one side.



Left—A mothering ewe is tied to a stick instead of being dragged to a fence. The rope has a chain with a swivel. Right—General view on the farm with shelter belt in background.

Left—Three-year-old Polled Angus cross steers ex King Country. Right—Good fences and shelter are important on any fat lamb farm.



Left—Small, handy yards at the far end of the farm save much time. Right—The trough, which is timbered and wired to prevent cattle from getting in. When lambs are about the ball-cock is lowered to reduce the depth of water and minimise the chances of lambs being drowned. Note the rough concrete block to enable lambs that have fallen in to scramble out.

leash consists of a chain and swivel, the swivel being on the end of the chain away from the sheep. The swivel attachment is most necessary. Coating the mothered lamb with the skin of the dead lamb is preferred as being the quickest method of mothering. Some years ago it was suspected that the incidence of arthritis was associated with mothered lambs, and by marking these it was found that the majority were infected. In handling lambs to be mothered the first thing that is done now is to treat the navel with iodine. This is most effective, and last year, for instance, there was only one reject from arthritis.

Studied Grazing

Remarkably complete records have been kept and made valuable use of, so that from the figures of past seasons it has been possible to learn exactly how many ewes and single lambs or ewes and twin lambs can be safely left to fatten in each paddock. Should the grass get away in a good season, cattle will be brought in to control it, which may be the case about the end of September. An outstanding feature of the management on this farm is the separate grazing paddocks for twins and for singles. Ewes with twins need better feed and the best paddocks are kept for them. On the other hand, it is sometimes found that a single lamb is unable to drink all the milk in the first few days and may concentrate on one teat. The other dries off, and as the lamb grows and can do with more milk this is not available. The ewes with singles are left in paddocks that have been close grazed, so that they will not milk too heavily at first, but come on with the growth. As a result of this sorting, paddocks with singles will be carrying say 4 to 4½ ewes to the acre, while those with twins will be running about 3 to the acre. The outcome of this policy is that twins average out equally as heavy as singles.

While twin lambs under their good feeding conditions thrive satisfactorily, experience shows that the earliest single lambs are more difficult, being inclined to scour in the middle of October with the strong growth of grass. The conclusion has been reached that these lambs are unintentionally run short of grass through having been born early in the growing season, and the policy is now to do the first 100 to 150 singles almost as well as the twins. There is then no question of any scouring and they come through as well as any of the later singles, which appear to be less subject to checks. It is suggested that the reason for this may be that after October feed conditions have settled down and there is then little variation in grass growth. Accordingly the ewes with these later lambs may be concentrated in paddocks at 7 or 8 or even more to the acre if necessary, and changed around without much possibility of upsetting their growth. However, if it is at all possible, lambs remain in the same paddock until fat.

Fats Away Readily

Having sorted the twins or singles to all the paddocks according to date of lambing and proved carrying capacity, practically an entire paddockful is ready to go at one time. There is little drafting to be done and fat lambs can be got away readily in six or eight drafts through the season. Ewes that have had their lambs go off to the works are never mixed with remaining ewes and lambs. Shearing is also carefully carried out so as to disturb the lambs as little as possible. Sheep are got into the yards only in small lots of about 150, just enough for the morning or afternoon. It has been found that with the heavier lambs separation from the ewes for a few hours is often sufficient to cause them to be weaned. Accordingly, the ewes with these lambs are not shorn until after drafting.

The result of this carefully-worked-out lambing policy is indicated in the summary below showing weights and gradings for each draft of lambs in the past season.

Flock Maintenance

Done early in June, crutching of ewes is carried clear around the belly, well over the tail, and with quite a lot out of the flank, so that there is never any chance of wool preventing easy access to the teats, and dagging rarely has to be done. This manner of crutching does not improve the appearance of the ewes, but it is effective and eventually saves work.

As is normal, culling is done mostly on the basis of teeth and constitution, but not on age alone, since an old and proved ewe is a more reliable mother than a poor 2-tooth. A careful inspection of udders is made to sort out any ewes with permanently-dry quarters. Practically the only dry ewes kept are those which are dry through no fault of their own (e.g., lambs born dead, or ewes that had pulpy kidney lambs). These are marked so that they can be left to have another chance. Replacements have usually been 2-tooths, thus reducing the replacement rate to about 25 per cent. and lessening the effect of price fluctuations in the ewe markets. There is no single source of supply, ewes having been drawn from Dannevirke and the King Country. Last year they came from Aria.

Feet are a most important consideration, coming in for attention

Lambs to works.	Down.	Prime.	2nds.	Rejects.	Average weights.
					lb.
121	120	—	—	1	48.02
242	229	13	—	—	42.43
328	326	1	—	1	43.32
250*	249	1	—	—	43.89
259	246	12	—	1	43.36
109	85	24	—	—	40.49
1,309	1,255	51	—	3	43.41

*This draft was all twins.

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twice a year, first in January and again in about May. This job is done sitting down, which is much easier on the back. From a pen in the woolshed the sheep are released to run into a long narrow trough containing a saturated bluestone solution, in which they are held for a few minutes before they are let run by operating a counterweighted gate. To do all this it is not necessary to move from the same pen.

Mortality Records

Very few farmers keep any accurate record of ewe and lamb mortality. When they do the results are invariably surprising, particularly with lambs. Probably a rough guess of the number of lambs born dead or dying up to docking would amount to about half the actual number. Figures on this farm covering a number of years show that approximately 110 lambs are lost up to docking and a further 12 or 13 die up to drafting, over half of these latter deaths being due to pulpy kidney. In other words the average lamb mortality amounts to about 10 per cent. of the number of ewes carried. Ewe mortality ranges between 33 and 40, or about 3½ per cent. Figures are also kept of the number of dry ewes and ewes which have lambed but have not reared lambs. These vary from 126 in 1942 to 85 in 1944.

"Cattle Make the Lambs"

Cattle, of course, play an important part in pasture control, in which role they are as important as a direct source of revenue. The policy is to winter 160 to 180 2- and 3-year steers, and this is done without any hay at all by making a point of saving adequate grass through management and fertiliser. Round about 80 to 90 yearling steers and 60 3-year-olds in store condition are bought at King Country spring cattle fairs. Depending on the season, the majority are quitted at the works in March, April, and May, but a careful eye is kept on the local market at Te Awamutu, where 30 to 40 fat steers are sent in September to reap the good returns for winter fattening. A recent draft averaged between £24 and £25.

Cattle are never run at the expense of the ewes and lambs, as "the cattle are there to make the lambs." During lambing the cattle are away out in the back paddocks and on the steeper country and roughest grass, but may be brought in to control the pastures if these get away from the sheep. Some time ago a breeding herd of 80 cows was run, but trouble with grass staggers and milk fever forced the conclusion that it was preferable to accept the risks of the store cattle market, even at the present prices and short supply.

Typically short rye-white clover pasture.

Topdressing

Topdressing policy is based on the opinion that if topdressing is carried out before the autumn rains, full benefit is secured from the March growing period. Therefore the topdressing is done usually in January or February, or commencing even as early as December, if the weather is suitable, to bring on the growth for winter cattle feed and ewes in lamb. There seems little point in late autumn topdressing on sheep country, it is felt, because normal growth comes in spring without it, and also much of the fertiliser remains dormant during the winter months. Last season fertiliser arrived in March and was held over for a wider application this year. Pre-rationing topdressing was at the rate of two bags per acre. For a period of three years the mixture of superphosphate, Seychelles guano, and potash salts in a ratio of 10 : 7 : 3 brought quite good results. Five years ago 150 acres received lime at 10cwt. to 25cwt. per acre, but this has not been repeated. While not advising against the practice, no visible results were obtained. As total carrying capacity has been increased over the period and no harm to the stock seems to have resulted, it is not intended to do further liming in the meantime.

Well-appointed Farm

This farm is well supplied with pumped water and concrete troughs. Over the troughs there are a couple of beams fixed to posts and barbed wire to keep cattle out, while on the inside a sloping piece of rough concrete rising to just under the water level enables lambs to scramble out of the trough.

All fencing on the farm is in first-class condition. The usual theory of sheep fencing is to keep the spacing of the bottom wires close enough to prevent lambs from pushing through, but in practice they often do get through and are unable to return. On this farm the wires are spaced wider to permit getting back, which the lambs do almost without exception. Top wires are kept close enough so that cattle are unable to push their heads through. The spacing of a seven-wire fence is, from the grass, 5in., 5in., 5½in., 5¾in., 6in., 6¼in., and 9in., with the top two wires of barbed 12 x 3 wire. Posts are 14 to 15ft. apart and battens 2ft. apart. Twelve gauge steel wire on three of the strands has proved quite satisfactory.

Actually, on every side, the farm reflects the essential fundamentals of farming—common sense and thoroughness—but in addition, Mr. Walker has taken an obvious pride in his work. There are no Taranaki gates on this farm—all are soundly constructed of thoroughly-seasoned timber, and given three coats of paint before being assembled. Everything in the sheds is orderly and neat, so that there is no delay in finding tools or equipment. A man who handles 1,200 ewes is a busy man and can afford little time in searching for gear. In fact, many jobs never get done on some farms because it takes too long to find the tools.

In the provision of shelter this farm is progressive, with belts of young *Lawsoniana* along most of the paddocks. Here again it is necessary to fence adequately, allowing 8ft. on one side and 10ft. on the other. The layout of the sheep and cattle yards, too, is excellent. There is no doubt that a tremendous amount of work has been done on this property, but the outstanding and consistent results fully justify the soundness of the farm management, giving the financial returns as well as the satisfaction of a job well done.

◆

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UNDER the auspices of District Pig Councils broadcasts will be delivered in January, 1946, as under:—

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Wellington—2YA, on January 17, at 7.15 p.m., "The Boar," by C. H. M. Sorensen, Supervisor, Taranaki District Pig Council.

Christchurch—3YA, on January 19, at 7.15 p.m., "Pig Competitions and Their Purpose," by H. McIntosh, Supervisor, Canterbury District Pig Council.

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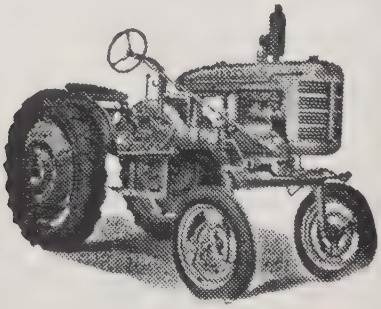

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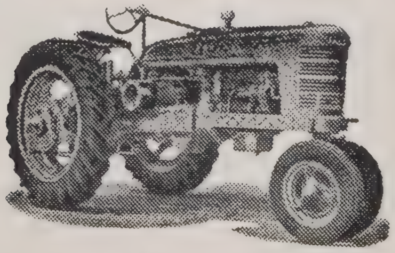

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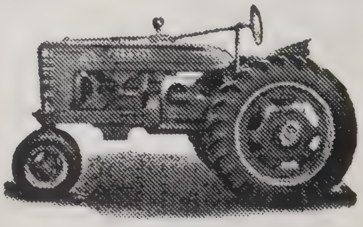

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Topdressing in Nelson

THERE are a great number of soils of distinctive properties in the Nelson Province and a wide climatic range between counties. In this article D. M. E. Merry, Instructor in Agriculture, Nelson, discusses evidence from field trials that reveals almost without exception a primary requirement of lime and phosphate in Nelson soils, and describes fertiliser trials and an increasing realisation by farmers of the need for topdressing.

TO many people the mention of Nelson brings to mind sunshine, fruitlands, hop gardens, and tobacco fields. While this is so, Nature in her artistry has bestowed on the province more mountain grandeur than fertile land.

There are four counties in the Nelson instructorate—Waimea, Takaka, Collingwood, and Murchison—of which Waimea County is the largest and most productive. Sir Theodore Rigg, Director of the Cawthron Institute, in a survey of the resources of the Waimea County in 1943, estimates that there are about 185,000 acres of improved cultivated land, with an annual production worth £1,200,000. Arable and pastoral farming contributes only £408,000 of this as follows: Sheep and cattle £189,000, dairying £150,000, and arable farming on 7,250 acres £69,000. By far the largest sum, £787,000, is derived from the fruit, tobacco, hop, and vegetable industries.

Topography and Soils

The Waimea Plain in Waimea County is the largest expanse of flat land in the province, and from this area the principal arable wealth is won. The lower plain in the vicinity of Stoke, Richmond, and Appleby is of heavier soils, and is depastured mainly for town milk supply. From Richmond to Belgrove at the head of the plain are considerable areas of stony loams, which dry out rather badly under the influence of sunny summer conditions. Although the rainfall is about 40 to 45in. annually, it is insufficient for good pastoral growth in the summer, and the tendency where ploughing is not frequently resorted to is for the grasses to revert to browntop dominance. On the eastern flank of the plain there is a low range of hills of reasonable fertility, while on the western side are low hills of inferior land extending from the coast to the mountainous hinterland. Near the coast these are popularly known as the Moutere Hills, and this name is generally given also to typify the soil type, which is a rather intractable clay, low in content of organic matter, and lacking in lime, phosphate, and nitrogen. Nelson has about 300 square miles of this country, which, although originally cleared from birch forest, has proved poor grassland, and considerable areas have now been re-afforested. Nevertheless, the soils of its valleys and some lower slopes can be brought into reasonable grassland, but Nelson's sunny climate militates against high pastoral productiveness here. While Waimea County has perhaps more than its fair share of poor land, it has, too, some very fertile land, the soils of the lower Motueka Valley and Riwaka being among the Dominion's best. These districts are closely settled, but because of the high per acre returns from hops, tobacco, and fruit, pastoral farming has a subordinate position.

Beyond Motueka, which is 35 miles from Nelson, the highway to Golden Bay passes through Riwaka, winds to the summit of the Takaka Hill (2,600ft.), thence down to the Upper Takaka Valley, and to Takaka, 70 miles from Nelson.

At the Takaka Hill, or more correctly the Pikikiruna Range, are extensive limestone fields, and the scintillating white marble is quarried near the road at "Ngarua" for industrial and agricultural use.

Takaka, pleasantly situated near the coast, with the fertile flats of Motupipi and Puramahoi nearby, is a favourable dairying district, and the back country is suited to sheep and cattle raising. Collingwood is 20 miles further on, on the coast at the mouth of the Aorere River, and is 90 miles from Nelson. Between Takaka and Collingwood lies an extensive tract of wet pakahi, which up to the present has not lent itself to profitable development. Rockville, another dairying settlement, is located on alluvial flats in the Aorere River valley, with the small settlement of Bainham a few miles further up the valley. Although no official figures for rainfall are available, Takaka has about 70in. yearly, and Rockville 100in. or more, due to its proximity to the west coast. Between Collingwood and Farewell Spit there are only isolated pockets of farming land, as the bush-clad, rugged mountains bear down to the coastline. There is, however, a narrow belt of pastoral limestone run country fronting on to the main west coast, and accessible through the mining settlement of Puponga and the Paturau.

To the south-west of Nelson and about 70 miles inland on the West Coast and North Canterbury highway via the Lewis Pass lies the township of Murchison, at the confluence of the Buller and Matakitaki Rivers. This fertile though small alluvial plain is suited to dairying and sheep farming. The contiguity of the surrounding mountains is responsible for the 70in. of annual rainfall being well distributed throughout the year.

There are a great number of soils of distinctive properties in Nelson Province, besides a wide climatic range between counties. The available evidence from the chemical survey of these soils reveals almost without exception their primary requirement of lime and phosphate.

Increased Topdressing

In the past 10 years (1933-34 to 1943-44) the trend of topdressing within the province is no better epitomised than in the statistical reports of agricultural and pastoral production. These are given by land district, which, besides the counties in the instructorate, also include Buller and Inangahua. These counties by geographical position are more commonly regarded as West Coast than Nelson.

The figures show that while 2,044 acres received lime in 1933-34, 10 years later 8,106 acres were limed. The total acreage of pastures sown on cultivated land receiving both lime and fertiliser for the 10-year period rose from 23,092 acres to 40,267, or respectively from 7.6 per cent. to 13.2 per cent. The Dominion average in 1943-44, the last year for which official data are available, was approximately 19 per cent. Nelson, however, reached its topdressing peak in 1940-41, when 49,858 acres, or 16.7 per cent. of the cultivated sown land, was topdressed.

Typical Moutere Hills country. Sown pastures have reverted to browntop-danthonia dominance, with a ground cover of moss. Much of this country is reverting to gorse, fern, and scrub. Heath, which may be seen in the photograph, is spreading extensively over these clay hills.

During the war, with superphosphate and other organic phosphatic fertilisers under ration and basic slag off the market, the use of lime in the Nelson land district has increased at least fourfold. The district is now well served with a number of modern crushing plants, the demand for agricultural lime is rising strongly, and the product is of exceptionally high grade. The big drawback, however, lies in high motor transportation costs from crushing plant to farm, which sometimes are almost half as much as the cost of the lime.

Fertiliser Trials

Manurial trials of various types have been laid down as widely as possible on grazing land in the several counties over the past 15 years. These have been variously patterned to test the efficacy of phosphatic fertilisers, lime, and potash alone and in combination, and all have been of the visual type where differences of sward or grazing preference have been recorded on three or four visits yearly. In earlier trials ammoniacal fertilisers were also used, but latterly they have been discontinued, as, except for special purposes, artificial nitrogen is unlikely to find wide usage. Organic nitrogen supplied to the soil through the medium of strong-growing clovers or other leguminous plants such as lupins, peas, or lucerne is now generally regarded as the more suitable and economical method of supplying nitrogen.

The phosphatic fertilisers under trial include superphosphate, serpentine superphosphate, basic slag, Heskett slag (produced in the Waikato using Nelson dolomite), and North African and Nauru ground rock phosphates. Potash was applied as 30 per cent. potash salts, and lime as the ordinary ground agricultural product available in the district of trial. Most of these experiments remained down for 3 to 4 years, though for various reasons some had to be discontinued before that time. Lime was applied at the commencement of the trials at 1 ton per acre, followed by annual dressings of 5cwt., while the phosphates were dressed initially and annually at 3cwt. per acre, and potash salts at 2cwt. yearly throughout the trials' currency. Unfortunately other urgent war work allied with staff shortage made it impossible to carry the serpentine superphosphate and

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some Heskett slag trials beyond the second year. Nevertheless it has been usual where one fertiliser is responding better than another for these differences to become apparent at a fairly early stage.

Of 28 experimental trials critically examined 19 showed a definite response to superphosphate alone, and an improvement with lime. No differences which were apparent to the eye could be seen in the remaining nine trials. This may have been because the land was already improved by organic sources before they were laid down, or because of the known insensitiveness of the human eye to responses of low magnitude.

Basic slag was superior to superphosphate on Moutere Hill clays, on Mr. F. C. Page's property bordering on the Wairoa River at Brightwater, and also on the reclaimed peat land of Mr. G. P. Dixon's farm, Wakapuaka, near Nelson. Basic slag has also given results comparable with superphosphate in the high-rainfall district of Rockville, and on one trial in the Murchison area. Basic slag generally has encouraged the growth of sown and native clovers.

Particularly on the Moutere Hills soils, the action of superphosphate was readily apparent in the freshening growth soon after application, particularly if rain followed, but this effect appeared to have largely diminished by the spring, whereas with the addition of lime, or basic slag without lime, each dressing produced a cumulative effect in the strengthening clover and the ability of the topdressed sward to remain verdant over dry summers. In this connection basic slag plus lime was always superior to superphosphate plus lime.

On the Moutere clays—one trial at Hope on the Waimea Plain, one on the alluvial flats at Rockville, one at Motupipi (Takaka), and one on reclaimed peat at Wakapuaka (Nelson)—potash together with superphosphate or basic slag greatly increased the density of the clovers. A rather striking result with 30 per cent. potash salts was secured on the Motupipi trial on Mr. K. W. Baird's property. There two attempts had been made to sow down a large grass and clover strains trial, but both failed through poor clover establishment. The manurial trial section was continued, and it was found clovers made outstanding growth on the potash-dressed sections. Evidently potash was a definite limiting factor.

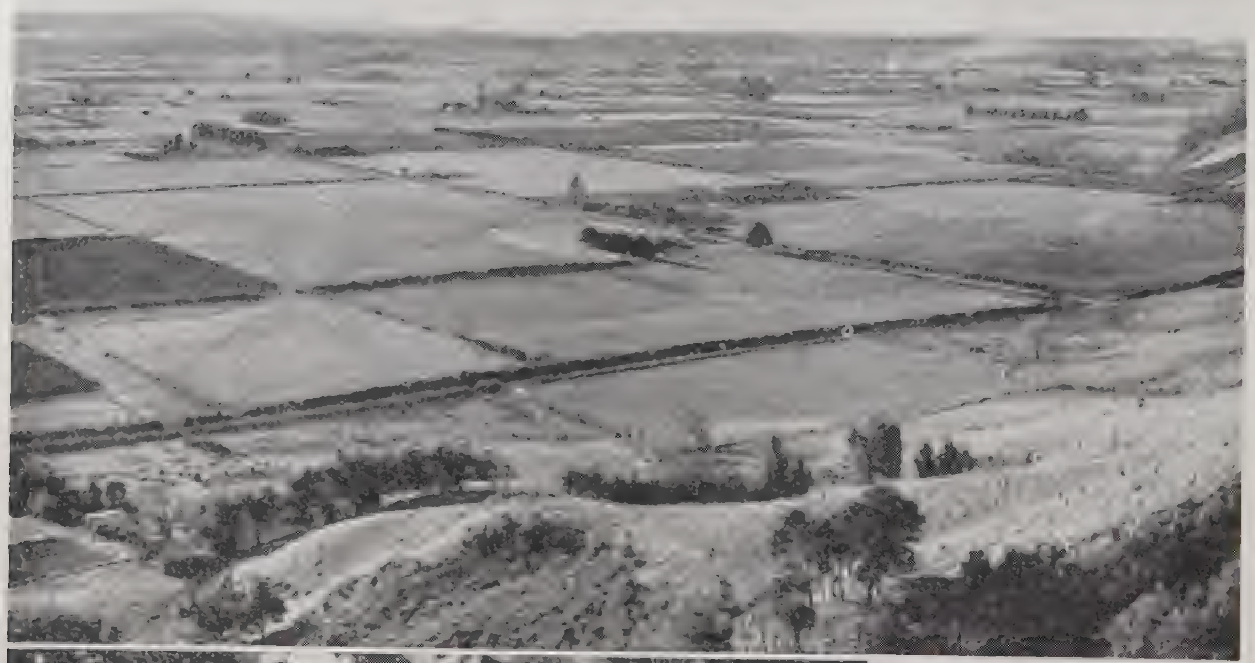
Another striking result, though this time with superphosphate, was obtained on a trial in 88 Valley, Wakefield, on Messrs. Parkes Bros.' property. Superphosphate alone on this

NELSON SOIL PROFILES

Profile of pakahi land. A layer of peaty soil overlies tightly-cemented ferrugenous gravels forming a layer impervious to drainage.

Soil profile of Moutere Hills country showing a shallow layer of a clay silt surface soil underlaid with tightly-packed watern-worn gravel set in clay.

VIEWS IN THE NELSON DISTRICT



Top—This photograph taken from the Aniseed Valley Hill looking toward Tasman Bay shows the extent of the arable Waimea Plain. The mountain range in the left background separates Tasman Bay from Golden Bay, while the low hills in the foreground of this range are popularly known as the Moutere Hills.

[*A. R. Kingsford photo.*

Middle—Quarrying pure marble at Takaka Hill, Nelson, for agricultural and industrial use.

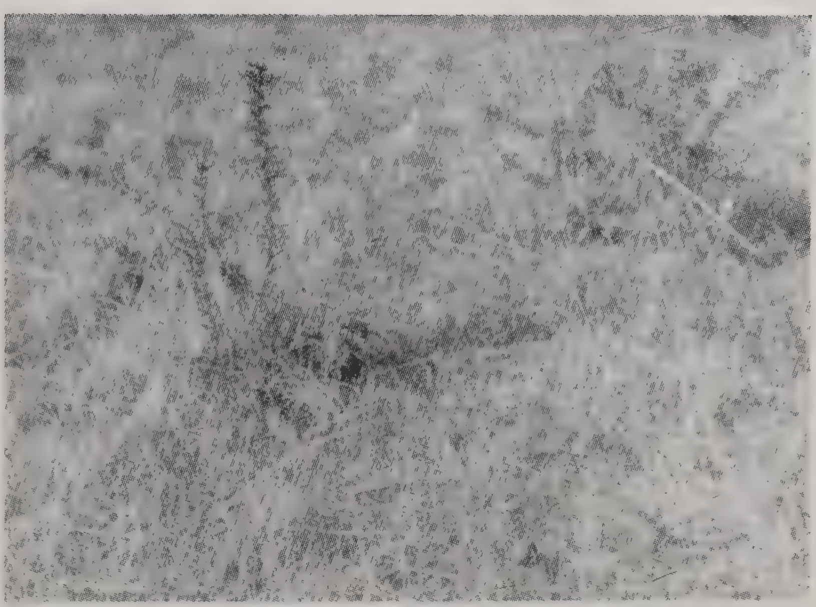
[*A. R. Kingsford photo.*

Bottom—Moutere type country, the lower hills and flats of which can be successfully grassed and held by the use of lime and phosphate.

trial was outstandingly successful. On no trials of ground rock phosphate of the Nauru or North African class was the response as good as either superphosphate or basic slag.

Trials with Heskett slag indicated generally that this fertiliser was a good deal slower in action than either superphosphate or basic slag, probably because of its lower soluble phosphate content. In one of nine trials (N. A. Win, Dovedale, Moutere clay) Heskett slag was superior to superphosphate but inferior to basic slag. Of the other eight trials in this series Heskett slag, though initially slow acting, became eventually equal in three to superphosphate and inferior in five.

Five good trials of serpentine superphosphate showed this fertiliser to be equal or almost equal to superphosphate, but the series could not be maintained sufficiently because of wartime difficulties, and, with the non-availability of basic slag for comparison, the findings must necessarily be regarded as insufficiently conclusive.



Pasture of this type will not pay to topdress. The grasses are browntop and danthonia with incoming gorse. Where the land is suitable it is best to plough, lime, and resow to certified strains.

Applicability of Results

Superphosphate following liming has been found to be a generally suitable fertiliser throughout the instructorate, but basic slag has been superior on soils of the Moutere class, and at least as good as superphosphate in the high-rainfall districts. The best results with these phosphatic fertilisers always follow after liming, and it is suggested that where pastures are resown at least 1 ton of agricultural lime should be used initially, and followed up each year with 5cwt., or more in the heavier-rainfall districts. Lime can be purchased in Nelson for approximately one fifth the cost of superphosphate, and without prior liming certainly the best results will never be obtained from superphosphate, serpentine superphosphate, or either type of slag. The agricultural limes in Nelson all range from 90 per cent. calcium carbonate purity to nearly 100 per cent. of crystalline white marble. On the soil it is likely that the crushed lime from these hard marbles will be a little less speedily reactive than the softer limes, but in turn will probably have greater longevity. All the limestones are very well ground.

Basic slag appears to produce a specially marked response on the Moutere Hills, which is somewhat difficult to explain on its phosphate and calcium contents alone. It is just possible that some of the normal impurities of basic slag may have some fertilising effect, as on these soils trace elements such as magnesium and boron, and cobalt on granite soils, have been found necessary for particular crops and for stock health. When basic slag is again available it could be profitably used, or alternated with superphosphate on the areas where trial has substantiated its usefulness. On poor land it is questionable, even though grassland responds, whether potash will ever be payable, which may also be the case on the plain under dry conditions. In the higher-rainfall districts the use of potassic superphosphate or slag and potash may be justified. The areas where it would seem most suitable are Motupipi, Rockville, and possibly the peats at the Glen, Wakapuaka. Before the war some farmers in the Rockville district occasionally used potassic superphosphate with good results. Serpentine superphosphate and Heskett slag would be quite worthy of further trial, the latter especially on clay land.

In general the returns from topdressing good land are better than from poor land, but in all cases it is a question of results and payability. An apparently good response to manure on poor country may not return its cost, while a less apparent result on good land may so increase carrying capacity or production that it is highly profitable. For Nelson conditions 2 to 3cwt. of phosphate per acre would appear to be the most remunerative rate of application.

Invaluable as are chemical analyses of the soil, actual topdressing trials are the best index of the soil's needs, as they show the most suitable form and amount in which to supply the deficient lime, phosphate, or, to a less extent, potash. Also the time of application has a positive effect on the period of response. For this reason early autumn topdressing is recommended in Nelson to spread grass growth more evenly over the growing season. Lime may be applied quite advantageously in the winter, as it is some time before it shows its effectiveness.

The day of the unenlightened farmer attempting the restoration of poor grassland with lime and sundry manures rather than by ploughing and resowing has not yet gone; from time to time he may be seen persisting in his efforts. In the years ahead the wealth of the soil must be won by speeding the plough, by sowing run-out grassland to proven strains, and beyond all by intelligent topdressing.

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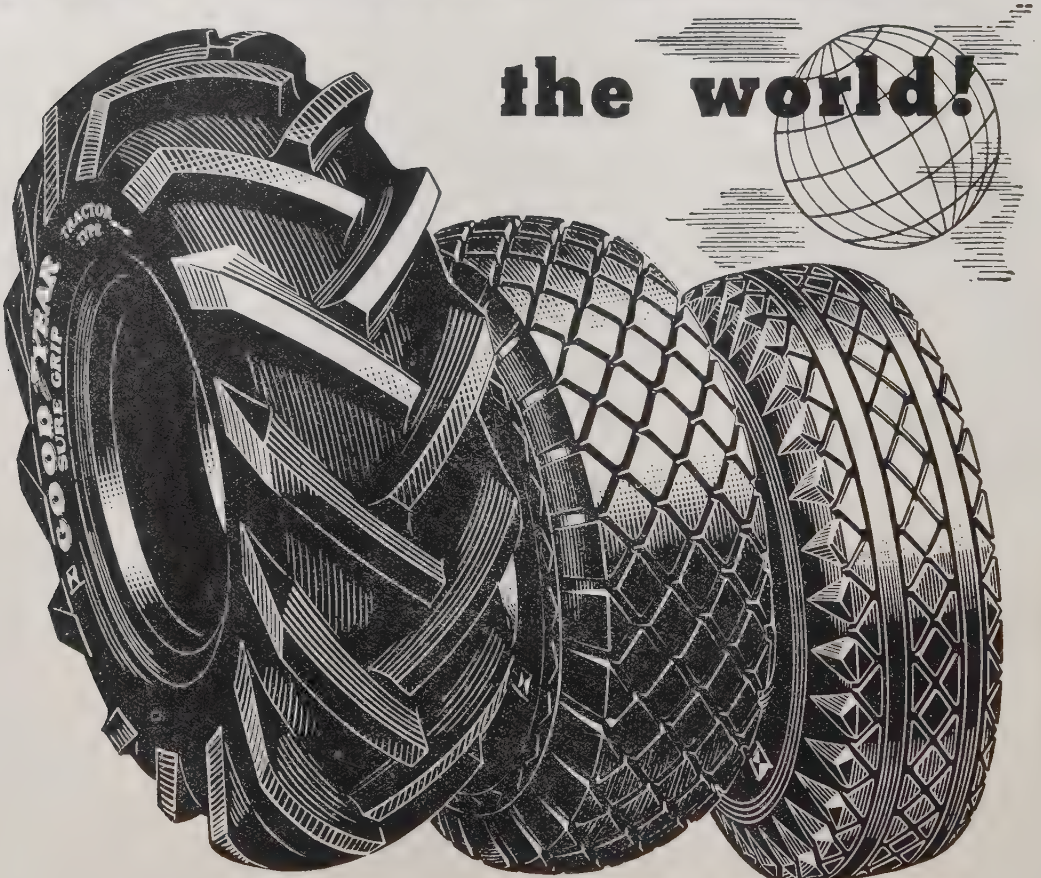

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Infectious Fowl Paralysis

(Neurolymphomatosis)

OUTBREAKS of infectious fowl paralysis have increased considerably in the last few years in New Zealand, and there is a danger that the disease might spread in this country to the serious proportions it has in other parts of the world, where it is now regarded as one of the major scourges of the poultry industry, writes Walter G. Fischel, Veterinary Research Officer, Animal Research Station, Wallaceville. A summary and discussion of the knowledge gained hitherto in this country and overseas is therefore necessary in order that steps may be taken to prevent a further spread of the disease.

INFECTIOUS fowl paralysis is a very widespread transmissible disease known to occur in all parts of the world. The first description of the disease was by **Marek** in Austria in 1907. Other names under which the condition is described are neurolymphomatosis, range paralysis, Marek's paralysis, leg weakness, paralysis of adults, and polyneuritis. The disease usually occurs in birds of the pullet age, older birds being only rarely affected. Fowls are found to be affected mainly under natural conditions, but outbreaks of an identical disease have been described in pheasants and turkeys, and it is known that these birds are susceptible to the artificial transmission of the infection. With several other allied conditions described under one heading by some authorities as "leucosis complex," it is considered to be a major problem to the poultry industry, causing losses in some countries exceeding those of any other disease.

The Causal Agent

The disease is caused by an infectious agent, a so-called "virus" invisible by even the best microscopes and passing through porcelain filters that retain bacteria. The virus circulates in the blood stream and is also present in other body tissues, in the eggs, and in the droppings. When the virus of fowl paralysis affects the nerve tissues it causes an enlargement due to the invasion of cells (lymphocytes) from the blood stream (see Figs. 3, 6 and 7). Symptoms of the affection need not necessarily be evident in infected birds, as is the case with birds in the very long period between the actual infection and the appearance of symptoms and lesions, and also with birds that have recuperated from the infection but may still harbour the causal agent in their body—so-called "carriers."

Transmission of Disease

The infection can be transmitted experimentally by direct or indirect contact, and occurs under natural conditions through picking up food contaminated with infected droppings or through blood-sucking parasites such as mosquitoes, ticks, and mites (red mite). Transmission via the egg is also an important factor in the spread of the disease. Various experimenters have proved, however, that chicks from affected parental stock reared in isolation showed a much lower incidence of fowl paralysis when compared with chicks from affected and disease-free stock reared in localities where the possibility existed of contact transmission. The role of the male bird in transmitting the infection by the mating act to the fertilised egg is still controversial.

Inoculation experiments have shown that birds in the chicken stage—up to eight weeks—are most susceptible; resistance to the infection increases markedly with age, and birds over one year old have been shown to be practically immune even to massive infection. The time lag from the date of infection until symptoms of the disease appear also increases greatly with age; it is usually about 5 weeks when one-week-old chicks are artificially infected, and it rises up to 32 weeks in birds infected at 20 weeks. Much longer periods are commonly observed in natural outbreaks.

Premises and grounds used by affected stock may remain infected for 6 months or longer; this and the possibility of transmission through apparently healthy "carriers," as well as the long incubation period, explain the slow and insidious spread of the infection, making the localisation and control of the disease so difficult once it has appeared in a flock. There is even the probability that the infection is present sometimes in a dormant form without showing symptoms.

Symptoms and Lesions

Various nerves may become affected jointly or separately in the course of the disease, causing paralysis of the limbs or the internal organs supplied by them. Most frequently observed and most obvious is the paralysis of one or both legs or wings. Affected birds show stilted gait at first, gradually developing into **leg weakness** and finally into complete **paralysis** of the affected limbs; affection of the wing nerves is shown by **drooping of the wings** (see Figs. 1 and 2). Other manifestations of the disease are **blindness** when the optic nerve is affected, or **"wry neck"** in affections of the nerve

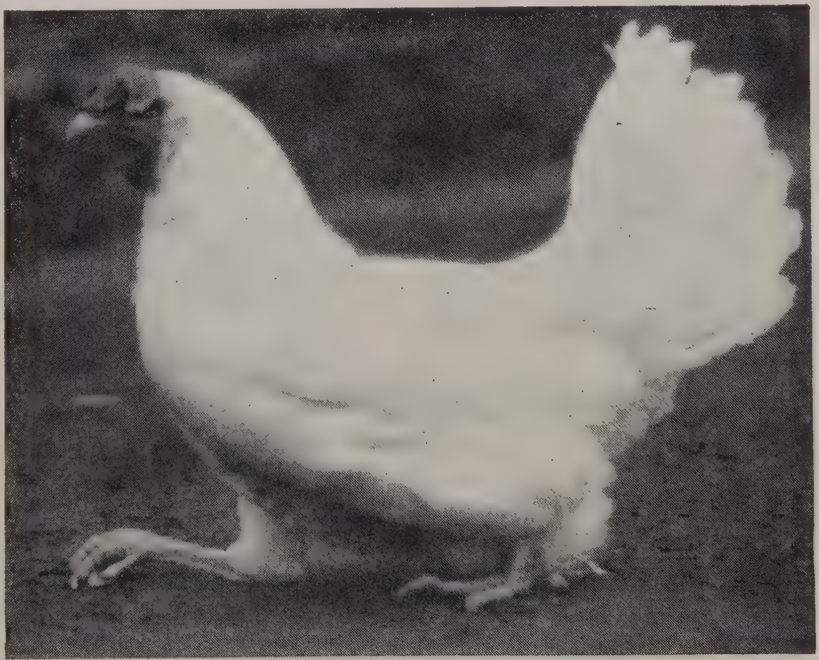

Fig. 1—Fowl showing leg weakness. The bird is unable to use the right leg, which rests on the ground over the whole length of the shank; note also the folding in of the toes.

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supplying the ear. **Breathing difficulties** are observed when the nerves of the throat are affected and **digestive disturbances** are due to an affection of the nerves of the crop or the bowels. Not all these symptoms are necessarily seen in one affected bird.

A very common occurrence in affected flocks are **eye lesions.** A fading of the normal colour of the iris of one or both eyes is observed, commencing as a circle around the pupil. Finally the iris becomes slate-grey or bluish ("grey eye," "pearly eye" or "iritis"), and there are frequently also irregularities in the size and shape of the pupils ("distorted" or "slit" pupil) (see Fig. 4). These changes are considered to be a manifestation of the same infection and a signal that infectious paralysis is present in the flock. The normal lack of pigment in the iris of birds during the first months of life should, however, not be confused with this condition.

Course of Disease

The symptoms of infectious paralysis may develop very quickly, causing death of the affected birds within a few days. More commonly, however, a much slower progress of the disease is observed, and affected birds can survive for weeks when kept in separate coops with access to food and water; such birds are usually in good appetite for a long time and appear quite normal except for their inability to use their legs or wings. Complete or partial recovery is sometimes observed, and such birds have to be considered as dangerous, for these apparently healthy "carriers" may still harbour the disease-producing agent in their body and thus disseminate the infection.

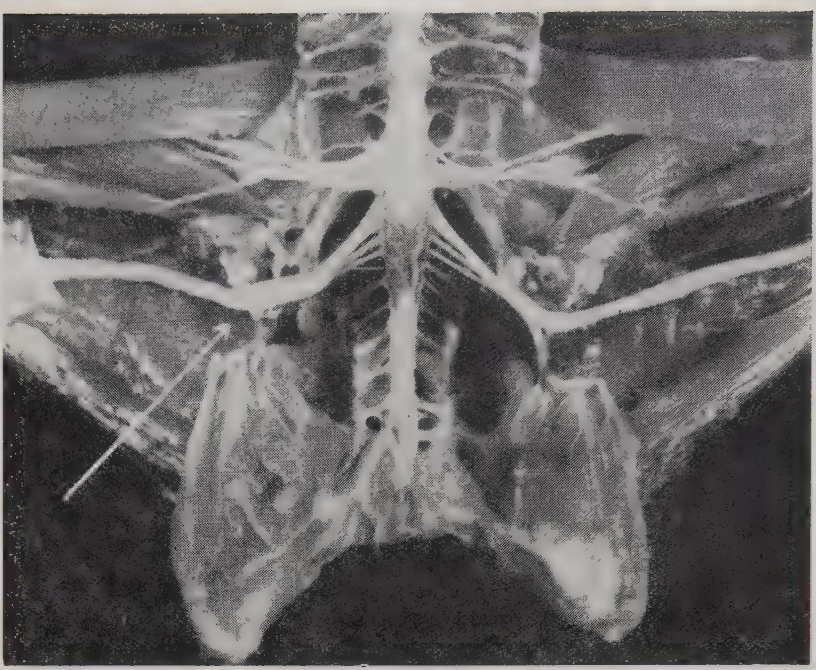

Fig. 3—Dissection of a fowl showing typical enlargement of the sciatic nerves, especially noticeable in the right leg.

Internal Parasites and Paralysis

The view that internal parasites such as worms or coccidia were alone, or at least to a great extent, responsible for outbreaks of infectious paralysis has now been discarded, as it is well known that the disease occurs quite frequently unassociated with parasitism. Internal parasites, infectious diseases, or nutritional disturbances may, however, considerably lower the resistance of the birds and make them more susceptible to the infection. On the other hand these conditions alone may cause weakness and emaciation and thus simulate outbreaks of infectious paralysis.

Paralysis and Allied Conditions

Many authorities overseas maintain that infectious fowl paralysis is but one manifestation of an infection which may also cause leucosis (big liver disease), osteopetrosis (marble bone disease), and even some of the transmissible growths of fowls, and describe them as diseases of the "leucosis complex." This view cannot, however, be confirmed by observations in New Zealand, where the different infections of the "leucosis complex" are most regularly observed in separate outbreaks. A considerable number of transmission experiments on the diseases of that group carried out at the Animal Research Station at Wallaceville have also given strong evidence of the diverse nature of these diseases. It can be assumed that these diseases are caused by different, but perhaps related, virus agents.

In the following table a summary is given of the relative incidence of the three main diseases of the "leucosis complex" as diagnosed on examation of fowls at this station over a period of 8 years. These figures, however, give but a poor indication of the prevalence of these diseases in New Zealand; according to the latest statistical figures from the U.S.A. diseases of the leucosis complex are responsible for more than 40 per cent. mortality of pullets in their first year.

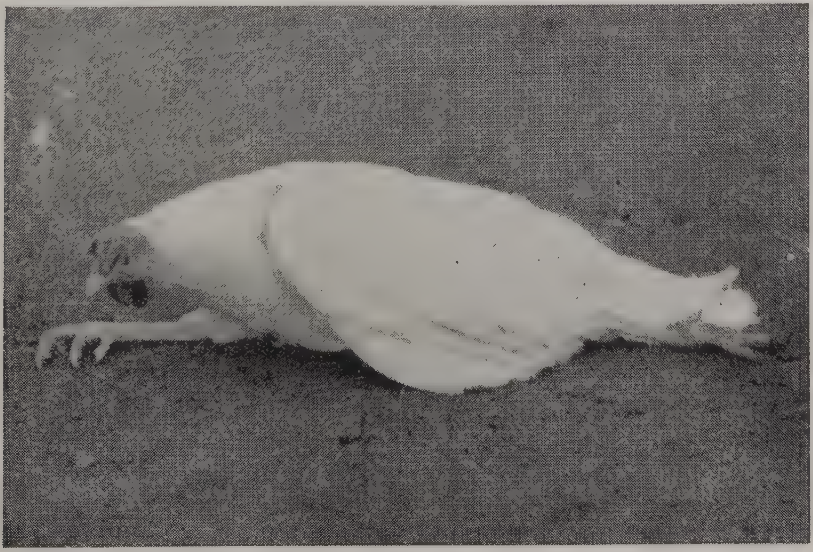

Fig. 2—Fowl showing total paralysis ("spraddling") of the legs; note also the drooping wing.

INCIDENCE OF DISEASES OF THE LEUCOSIS COMPLEX (L.C.)
(POST-MORTEM FINDINGS AT THE ANIMAL RESEARCH STATION, WALLACEVILLE.)

Year	Number of Fowl Specimens (excl. Chicks).	Leucosis Complex No.	Leucosis Complex %	Fowl Paralysis No.	Fowl Paralysis % L.C.	Leucosis No.	Leucosis % L.C.	Osteopetrosis No.	Osteopetrosis % L.C.
1937-38 ..	184	26	14.1	4	15.4	21	80.8	1	3.9
1938-39 ..	207	45	21.7	2	4.5	42	93.3	1	2.2
1939-40 ..	313	69	22.0	17	24.6	47	68.1	5	7.2
1940-41 ..	313	71	26.8	20	28.2	42	59.1	9	12.7
1941-42 ..	490	129	27.1	66	51.2	56	43.4	7	5.5
1942-43 ..	514	129	25.1	51	39.5	70	54.3	8	6.2
1943-44 ..	620	121	19.5	53	43.8	65	53.7	3	2.5
1944-45 ..	727	122	16.7	60	49.2	56	45.9	6	4.9

Other Causes of Paralysis

Many other diseases and conditions can also cause leg weakness and paralysis, and may thus be confused with infectious paralysis. Among these are certain infectious diseases such as tuberculosis, joint ill, and encephalomyelitis (the last-named not yet observed in New Zealand), nutritional diseases such as rickets and many other mineral and vitamin deficiencies, and a great number of local conditions such as joint gout, bumble foot, rheumatism, pressure on the nerves by growths in nearby organs (see photograph), or even the pressure of an egg on the sciatic nerve—so-called "layers' cramp." General weakness in the course of parasitic or infectious diseases (worms, coccidiosis, etc.) may also cause disinclination to move about and thus imitate paralysis.

Such a variety of conditions which may be confused with infectious paralysis emphasises the necessity of careful examination, often with the aid of the microscope and other laboratory procedures. When cases of paralysis are observed in a flock it is therefore most essential to have expert opinion and an early diagnosis of the cause of the trouble, which can be obtained free of charge by forwarding one or two birds representative of the condition and preferably alive addressed to the Chief Diagnostic Officer, Animal Research Station, Wallaceville. An advisory letter should accompany the consignment containing statements on the history of the trouble, the number of birds affected, and any other information on the outbreak.

Control Measures

Despite the great economic importance of this disease and the fact that it has been studied now by many experimenters and field workers from different angles, there are still no simple means known to control the disease effectively. Medicinal treatment has so far been of no avail, and even if successful, it would only keep alive and increase the numbers of potential carriers of the infection. This holds true also for the injection of potassium iodide as sometimes recommended (Gray treatment) and the alleged beneficial influence of wheat germ oil when fed to affected and in-contact birds. Promising results have been reported lately from the administration of some sulpha drugs; these attempts are still in the experimental stage, however, and it is too early yet to decide whether such treatment should be recommended as a routine measure in outbreaks of the disease.

The only measures available to control infectious paralysis with some promise of success are **sanitation** and **breeding.**

Sanitation:

Profitable management of poultry flocks can be achieved only when the stock is well housed and yarded in clean sanitary quarters, and fed a complete ration containing all essential requirements. Stock kept under these general hygienic conditions are more resistant to any adverse influences and will not fall an easy prey to the various infectious agents or parasites. Owners of stock free from disease should be very careful in the pur-

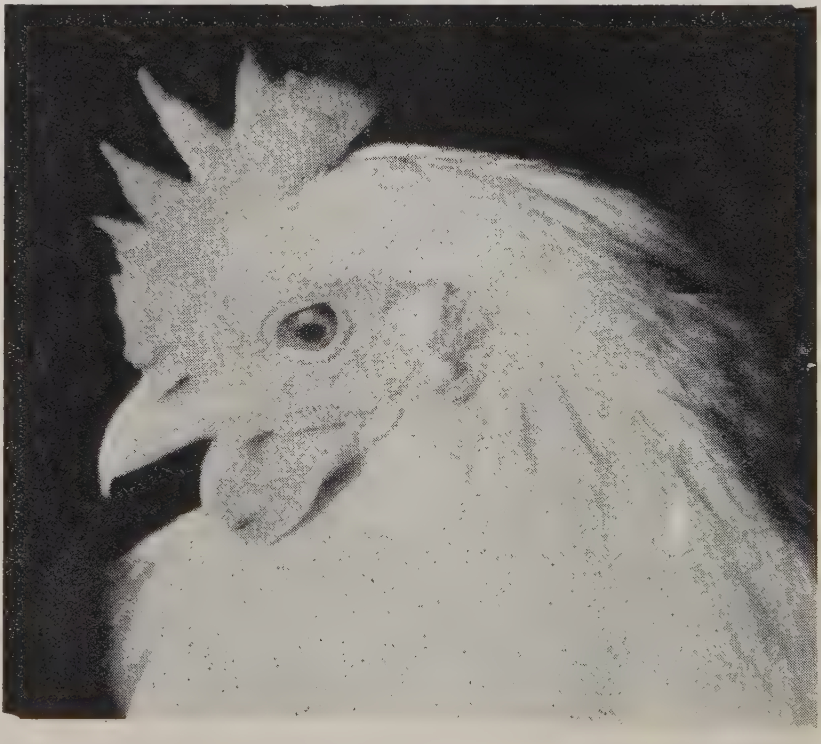

Fig. 4—Discoloration of the iris and distortion of the pupils in an affected fowl.

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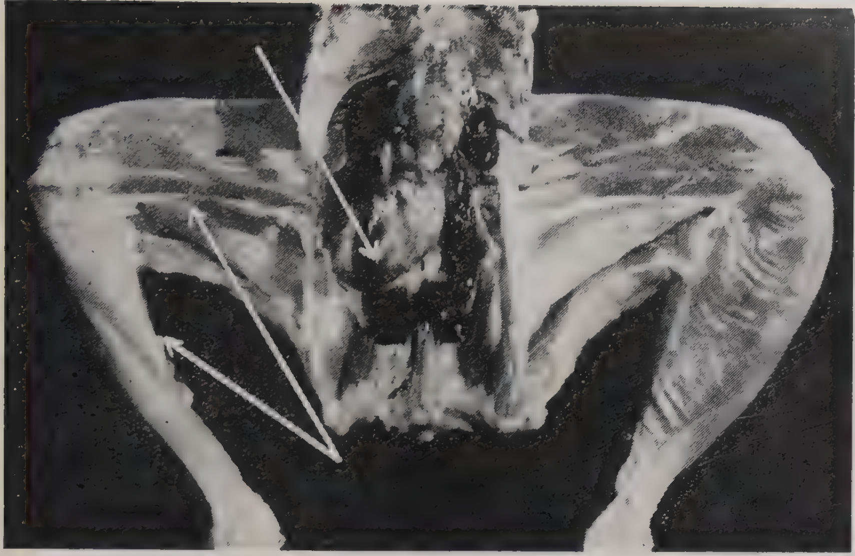

Fig. 5—Dissection of a fowl which had exhibited symptoms of paralysis. A large growth in the right kidney was interfering with the nerve and blood supply to the leg, as evidenced by the wasting of the leg muscles in the affected limb.

chase from unknown sources of eggs for breeding, day-old chicks, or adult birds. Once an infectious disease has been introduced in a flock, however, it is essential to prevent the spread of the infection by strict hygienic precautions.

In the case of infectious fowl paralysis the following recommendations regarding sanitation should be followed:—

Affected birds showing evidence of paralysis in any of the forms described should be eliminated from the flock and destroyed.

The premises, runs and implements used for affected and in-contact stock should be cleaned and scraped thoroughly and afterwards treated with a reliable disinfectant. Cleaning and disinfection should be repeated at short intervals. The following disinfectants can be recommended:—

Hot water containing **washing soda** at the rate of 1lb. per 20 gallons, for scrubbing the walls, floors, and all the equipment used in the houses.

Carbolic acid (1 : 20) or **compound cresol** (1 : 40) for spraying the houses and implements, to be followed by a spray of whitewash containing 6oz. of crude carbolic acid per gallon.

Quicklime as topdressing for the runs, spread at the rate of 2 tons per acre and superficially ploughed or dug in; the treated runs should be spelled for at least 6 months.

All young stock should be reared on new ground and in complete isolation from adult birds for the first 5 months. Brooder houses and growing pens should be at least 50 yards away from the laying sheds and runs used by adult birds.

Breeding:

Evidence has been presented by a number of experimenters that heredity is an important factor in the resistance and susceptibility of stock to various infectious diseases; this holds true also for infectious paralysis. This genetic approach to disease control is receiving great attention at present, but it is still in the experimental stages.

The hereditary influence on the susceptibility of birds to the infection and the evidence of transmission of the infection via the egg suggest the following additional control measures:

Eggs from birds having recovered from the infection, or from pullet stock exposed to infection with fowl paralysis, should in no case be used for breeding. Eggs from in-contact hens which at no time had shown any symptoms of the disease may, however, be bred from, as these have at least proved their ability to resist the infection; this would be an effective means of building up disease-resistant stock.

The breeding stock should be selected with proper hereditary resistant factors; breeding flocks should be closed to unproved stock from outside, in order to prevent the introduction of susceptibility to the infection, or even of the disease itself. The danger of inbreeding is very small indeed, when it is carefully planned, and many successful breeders have maintained closed flocks without any impairment to the reproductive ability or the general health of their stock.

Summary

1. **Infectious fowl paralysis is transmitted by direct or indirect contact**

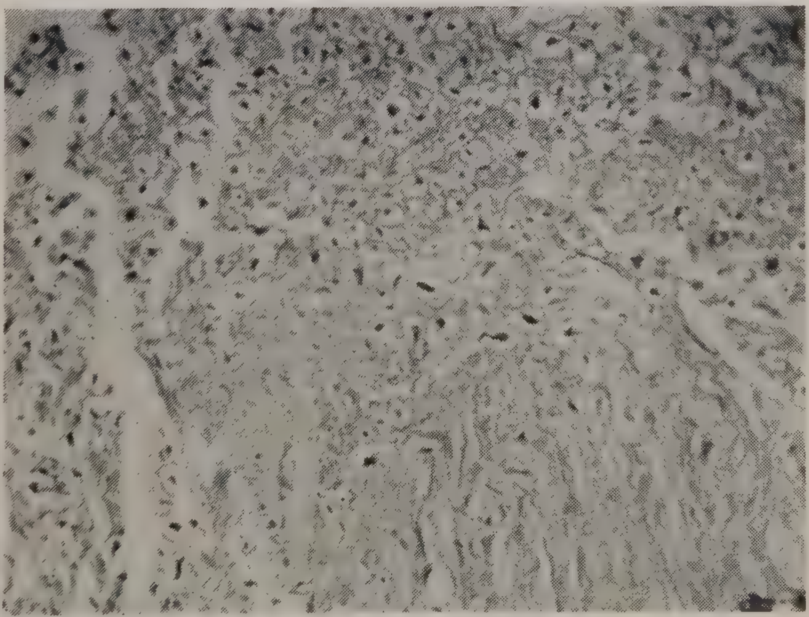

Fig. 6—Photomicrograph of a normal, unaffected nerve (cross section). The nerve fibrils are seen as clear rings round dark centres.

"Internal Parasites in Poultry" is the subject of a special bulletin issued **free** by the Department of Agriculture. This bulletin deals with the various types of worms and gives methods of treatment. Write to the Department of Agriculture, Auckland, Wellington, Christchurch or Dunedin for a copy.

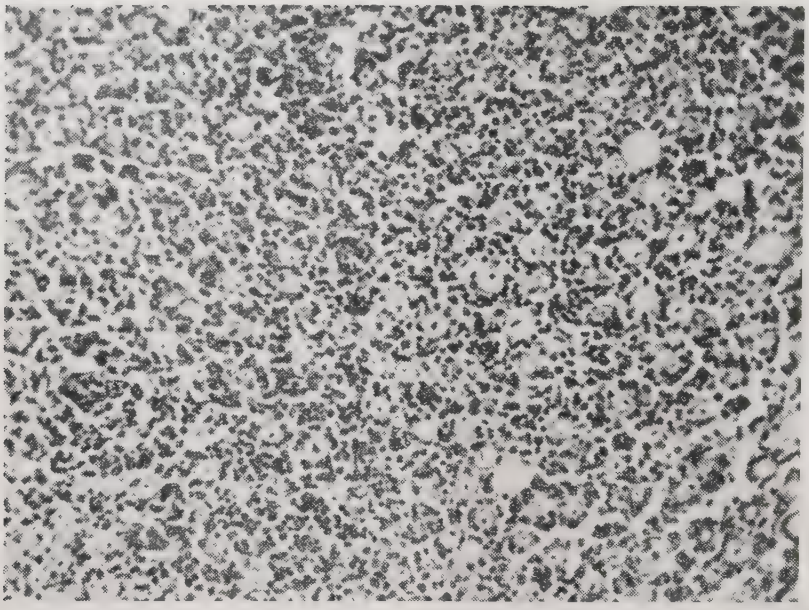

Fig. 7—Photomicrograph of an affected nerve (cross section). Masses of infiltrating cells are distinctly visible between the nerve fibrils.

of susceptible birds—chicks in the first few months of development—with diseased or "carrier" birds or via the egg to the offspring.

2. **The time from the actual infection until symptoms of the disease can be observed is very long (5 weeks to several months), and the infectious agent may stay alive for long periods on premises and grounds used by infected stock. The necessity of an early and exact diagnosis is evident in view of the many other conditions which might be confused with infectious paralysis.**
3. **No treatment of any value is known for this disease, and only sanitation, isolation of the young stock, and rational breeding methods are available for the successful control of the infection.**

All photographs used in illustrations are by A. Bryant.

Cow with Leg Injury

"E.D.," Riverlea:—

One of my cows has lately become very thin and seems to be getting worse. The trouble is worse on the right side and her hip protrudes to such an extent that she cannot use her leg, which makes me wonder if the stifle has been put out. If it has, could you tell me how this trouble is generally caused and is there any remedy for it?

LIVESTOCK DIVISION:—

The symptoms described by you are not quite clear and definite enough to enable any opinion to be formed as to the exact nature of the injury affecting your cow. A sketch or photograph would have presented more detail in such a case.

You refer to the hip protruding more than normally and then refer to the stifle, which is the next joint down the leg. Dislocation of the patella, the small bone at the stifle joint, frequently occurs, but in the cow this small bone dislocation does not cause such a serious lameness as described by you.

It appears as if your cow is suffering from a fractured pelvis or other serious fracture of a bone of the affected leg. If the cow has been a heavy producer, the bones may have become brittle and lacking in mineral matter, and any slight accident would account for a fracture in such an animal. It would be advisable to have the animal examined by a veterinary surgeon, and you should be guided by his advice.

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STUDIES IN FARM MANAGEMENT

Sharemilking in North Taranaki

SHAREMILKING has played a large part in the development of dairy farming in Taranaki. Farms originally taken over in country carrying the natural rain forests in many instances were found on development to be too large for one dairy herd, so a second herd was put on and an employee engaged on a share basis. Thus sharemilking was started. Many a successful dairy farmer in the dairying districts of New Zealand today gained his initial experience in dairying as a sharemilker and was able to obtain sufficient capital to commence operations on his own. A typical farm on which the sharemilking system operates is described in this article by A. C. Burgess, Instructor in Agriculture, New Plymouth.

TO the overseas visitor Taranaki is the district where Mt. Egmont is situated, but the New Zealander knows it as one of New Zealand's richest dairying districts. Mount Egmont, rising from a picturesque countryside to a height of 8,260ft., does, in fact, have a profound effect on the life of Taranaki, being largely responsible for its climate. Close to the sea temperatures are mild and the rainfall ranges from less than 45in. in the south to 60in. in the north, while nearer the mountain the winter is more severe and the rainfall higher. Up on the mountainside near the National Park boundary the rainfall is about 100in. Even at Inglewood, only 12 miles from New Plymouth, the rainfall is about 80in. The climate compares favourably, however, with that of other dairying districts, and the well-distributed rainfall is responsible for a good growth of grass from early spring to late autumn, and summer droughts are rare.

RAINFALL FIGURES FOR NEW PLYMOUTH, 1940-44.

1940 ..	60.34in.	1943 ..	64.95in.
1941 ..	68.99in.	1944 ..	65.55in.
1942 ..	63.82in.		

Soils

Long before New Zealand was populated Mt. Egmont erupted at various times and covered the surrounding area with layers of volcanic ash, from which the soils of Taranaki's dairying land have been formed. The soils are therefore generally light in nature and are fairly well drained, the only swampy areas of any size being in the eastern part of the district. Phosphate gives the best results from topdressing, and potash gives a very good response over a large part of the district. Lime does not give spectacular results generally, but its use is warranted on most of the soils in the district.

A superphosphate works about 3 miles from New Plymouth supplies the district's requirements, while lime is transported from Te Kuiti and Waitotara, south of Patea.

Transport and Roading

Transport facilities are very good. Roads are well formed and the railway from Wellington runs to New Plymouth and Waitara. At Stratford this line is joined by a branch line running from Taumarunui on the main Auckland-Wellington railway.

The port of New Plymouth is quite an important one in the New Zealand coastal trade, a considerable amount of farmers' requirements and production being handled there.

Land Settlement

The first settlers on the land in Taranaki were probably those who benefited from the first servicemen's rehabilitation scheme in New Zealand. After the Maori Wars small outposts were maintained to keep the Maoris in check, and in return for their services the volunteers for this force were given blocks of land which were cleared of bush and farmed. Such areas were, however, small, and the main areas were acquired from the Maoris by purchase or lease.

Development of Sharemilking

Many of the early settlers acquired more than one block of bush-covered land, and when these were cleared they were grazed and gradually developed until they could be used for dairying. The owner would remain on the farm where he had built his homestead and on the other property, which could not now be managed by himself, a hired manager would be installed. It is in these old-established parts of the district that sharemilking has always been fairly common.

The Tikorangi district, on the northern side of the Waitara River, is one of the earliest-established parts of Taranaki, and here the holdings generally are larger and sharemilking is carried out quite extensively.

In 1888 one of Tikorangi's earliest settlers, Mr. Thomas McKenzie, acquired a block of 199 acres on the Waiau Road. It was leased from the Maoris and was in heavy standing bush, mainly tawa, rimu, rata, and puketea. By degrees the bush was felled and cleared, and pastures were established on the ash from the burn. Large numbers of fencing posts were carted out to the coastal area, where good material was scarce. Then the slow, heavy work of stumping and clearing the land for ploughing was started, and in place of the purely grazing management grain and fodder crops were grown and mixed farming was adopted. Some good cocksfoot seed was harvested each year at this time also. Gradually over the years most of the farm was ploughed and cropped

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and sown in good pasture, until in 1925 a change-over was made to straight-out dairying. It was then that sharemilkers were first employed.

By 1916 the farm was well on the way to becoming developed, and Mr. McKenzie bought another farm of about 60 acres on the Inland North Road. Here he built his homestead, and farmed until he retired, when his son, Mr. Roy McKenzie, took over the farm. Mr. McKenzie, senior, who is now over 80 years of age, lives in New Plymouth.

There were, of course, no roads in the area in the early days, and a bridle track was the only means of access. Later a clay road was made, but it was not until 1926 that the road passing the property was properly formed and metalled.

In 1925 70 cows were milked and total production was about 7,000lb. butterfat. With the increased use of fertilisers, the pastures were improved, and herd testing and the use of good bulls brought about herd improvement, until a maximum production of over 36,000lb. of butterfat from 115 cows was attained in 1938.

General view of the farm.

Sharemilking Agreements

A sharemilker on a farm has a much more personal interest than a man merely working for wages. The usual agreement stipulates that the owner of the farm shall provide the milking herd, farm buildings, equipment, and plant for the efficient running of the farm.

Fertilisers for topdressing and seed for crops or pastures are also supplied by the farmer. The sharemilker milks the cows, feeds and generally cares for the stock, including pigs, and carries out normal maintenance work on the farm, in return for which he receives not less than 33⅓ per cent. of milk or cream cheques. In addition he receives one half the value of all calves, and half the value of pigs.

The following are the standard terms and conditions of a sharemilking agreement in those cases where the farmer-owner provides the herd:—

1. Any agreement shall be operative for the period specified.

2. Before entering into any agreement sharemilkers shall have made available to them in writing the previous year's figures of production, the number of cows producing those figures, and the minimum quantity of manure to be applied in any one season.

3. A sharemilker whose duties comprise only milking and care and feeding of stock, including pigs, shall receive not less than 25 per cent. of milk and cream cheques and deferred payments. Where he also does maintenance work he shall receive not less than 33⅓ per cent. in either case, after deduction of cartage of cream and milk. To the above shares of 25 per cent. and 33⅓ per cent. shall be added a surcharge of 10 per cent. of the sharemilker's share. He shall not contribute towards the payment of any shares nor receive any benefit from the share bonus unless mutually agreed upon.

4. If the farm-owner provides an efficient bull paddock, the sharemilker shall undertake care and custody of the bull or bulls and other stock, and shall be responsible for damage done by wandering bull or other stock.

5. The sharemilker shall receive half-share of the value of all calves, which shall be valued as grades, including bobby calves and pigs, which shall be valued as grades, providing the sharemilker buys in as grades.

6. Calves reared shall be valued during January or February as mutually agreed upon; the farm-owner to take over the calves as at that date.

7. The farm-owner may require calves for rearing for replacement purposes up to 25 per cent. of the herd. In cases where additional replacements are needed this number may be increased by agreement in writing at the commencement of the season.

8. Both parties shall pay equally all costs of breeding sows and other pigs, including cost of supplementary feeding, cartage, and commission.

9. Farm-owner shall provide reasonable facilities for feeding, housing, and grazing all pigs, such reasonable facilities to include separate house for each breeding sow at farrowing time. Pigs shall be efficiently ringed according to directions of the farm-owner, and where pigs are not so ringed the sharemilker shall be responsible for any damage done.

10. The farm-owner shall provide motor-lorry or horse conveyance for the purpose of carting milk to the factory and for other farm purposes, except where the sharemilker agrees to provide his own. The sharemilker to pay one-third of the cost of benzine, oil, and running costs, also one-third of the registration and licence fee, and also depreciation at the rate of 5 per cent. per annum.

11. (a) The farm-owner shall provide all implements, plant, and equipment for the efficient working of the farm, except where the sharemilker agrees to provide his own. Any expense incurred by the farm-owner through damage to his plant or equipment caused by the neglect of the sharemilker shall, at the termination of the contract, be the responsibility of the sharemilker and be met by him: Provided always that the farm-owner shall provide suitable cover or shed for all such plant and equipment. In the case of a dispute, a competent person shall be ap-

General view of Tikorangi district.

pointed, acceptable to both parties, to examine the equipment and to decide the responsibility for payment.

(b) Sharemilkers agreeing to supply milking plant, horses, wagons, and cans, or any part of same, shall receive such additional amount as shall be agreed upon for the value of such equipment as at the commencement of the contract, but in no case less than 10 per cent. of the value of such equipment, to be paid in equal monthly instalments. Sharemilkers agreeing to supply lorries for the purpose of carting milk to the factory, and for other farm purposes only, shall be paid two-thirds of the cost of benzine, oil, and running costs, also two-thirds of the costs of registration and licence, also depreciation at the rate of 5 per cent. per annum. The farm-owner shall be responsible for meeting the cost of reasonable repairs to such implements, except where such repairs are rendered necessary through the neglect of the sharemilker. The farm-owner shall provide suitable cover or shed for all such plant and equipment.

12. All rubberware shall be in a satisfactory condition at the commencement of contract, and shall be left by the sharemilker in the same condition at termination of contract.

13. Buckets and brushware shall be supplied by the sharemilker, but at the commencement of each season the farm-owner shall equip the shed with leg ropes and a shed shovel.

14. The sharemilker shall pay power costs for milking, but it shall be the duty of the farm-owner to supply adequate facilities for boiling water, and to pay half power and fuel costs for same.

15. The farm-owner shall have the right to determine the factory or company to be supplied, and whether milk or cream shall be supplied.

16. The cost of seed and manure for supplementary and/or winter crops shall be borne by the farm-owner, and the work shall be done by the sharemilker.

17. General farm work which shall be done on the farm shall be outlined in writing at the commencement of the contract by the farm-owner and carried out by the sharemilker. Stumping, clearing, erection of new fences, and generally breaking in rough farmland to be the responsibility of the farmer, and not to be included as general farm work. Where work which is the responsibility of the sharemilker is not carried out satisfactorily, the owner, after giving reasonable notice in writing to the sharemilker, shall have the right, if it is not performed by the sharemilker, to have the work done at the expense of the sharemilker. Where through sickness or otherwise the sharemilker is unable to carry out his part of the agreement, he shall give notice in writing to the farm-owner so that arrangements can be made to carry out the work. In the event of any dispute regarding the matters contained in this clause, the matter shall be referred to arbitration.

18. Cost of manure for maintenance purposes, including cartage, shall be borne by the farm-owner.

19. The additional labour required for hay and silage making for the herd shall be provided by the sharemilker and farm-owner equally.

20. The farm-owner shall provide adequate water for stock, sheds, and household purposes. Where satisfactory drinking water for domestic use cannot be obtained from other sources, sufficient tank accommodation for the collection of rain-water shall be made available at the house of the sharemilker. The farm-owner shall pay actual cost of power for pumping water for stock, sheds, and household purposes.

21. Except as hereafter provided, fences, drains, and hedges to be maintained in a satisfactory state of repair by the sharemilker, but the cost of trimming any hedge which has not been trimmed within three years shall be borne by the farm-owner. Temporary subdivision fences shall be erected by the sharemilker with material supplied by the farm-owner. New permanent subdivision fences shall be erected and paid for by the farm-owner, who shall supply all the necessary material. Where drains exceed a length of 1 chain per cow milked, the cost of cleaning the additional length of drains shall be borne on a fifty-fifty basis by the sharemilker and the farm-owner, but the responsibility of the sharemilker in this respect shall not apply in the case of drains which do not directly drain that portion of the property on which the dairying operations are carried on.

22. Farm-owner shall pay for all herd-testing, including tester's board at 2s. per item.

23. The sharemilker shall provide and shall have complete control of all labour to be engaged by him.

24. The sharemilker shall bear his proportion of deduction in connection with the grading of milk and cream, except in the case of proved neglect, when the responsible party shall bear the whole of such deductions.

25. Farm-owner shall supply all medicines, etc., for the health of stock, same to be used by sharemilker as directed. Sharemilker shall take all necessary precautions to prevent disease in the herd, and in case of disease shall notify farm-owner immediately, but shall not be held responsible for disease or replacements of stock rendered necessary owing to disease, etc., but due to no neglect or fault of the sharemilker. A suitable locker shall be installed in a convenient place.

26. The sharemilker shall take all reasonable care to prevent the spread and/or introduction of noxious weeds, the cost of material to be borne by the farm-owner.

27. Sharemilker shall whitewash sheds when required by the farm-owner, but not more often than once yearly, except at the expense of the farm-owner. Nevertheless, in cases of supply to towns or institutions the shed shall be maintained according to the requirements of the appropriate authorities, the material only to be supplied by the farm-owner. There shall be lavatory accommodation within reasonable distance of the milking sheds.

28. No additional stock (except replacement stock up to 25 per cent. annually), including sheep, shall be grazed on milking paddocks used by the sharemilker except by mutual consent, which consent shall not be unreasonably withheld, and all culls shall be removed from milking paddocks within one month from the date of culling. The sharemilker and the farm-owner each to have the right to run up to 15 sheep for killing purposes.

29. Milking must be efficiently carried out, and the farm workers shall be competent, but the number and sex to be employed shall be mutually agreed upon between the farm-owner and the sharemilker.

30. Sharemilker's share of the cheque without any unauthorised deduction shall be paid by farmer direct into sharemilker's banking account, or direct to the sharemilker, accompanied by copy of monthly statement in either case; settlement to be made within three days of receipt of money by the farm-owner.

31. All moneys due to the sharemilker for pigs sold in farm-owner's name by sharemilker shall be paid over to the sharemilker by the 25th of the month following the sale of same. A statement of all pigs sold to be supplied to the sharemilker.

32. If either party does not propose to enter into another contract for a further period, notice thereof shall be given in writing to the other party not less than one month prior to the expiry of the current contract.

33. Farm-owner shall pay all droving fees.

34. The stipulated number of cows to be milked shall be stated in writing, including the words "and not less than." Such stipulated number of cows shall be in-calf cows or heifers, and shall not include cows which prove at calving to have lost two or more quarters.

35. The owner shall have the right at any time during the continuance of this agreement to sell the said land or any part thereof and cancel this agreement, in which case the sharemilker shall be entitled to receive from the owner an amount equal to the sharemilker's proportion of the value of the estimated butterfat for the balance of the season, including deferred or final payment or bonus. In the event of the owner and the milker failing to agree as to this estimated amount of butterfat, the previous year's production shall be taken as a basis. The total pro-

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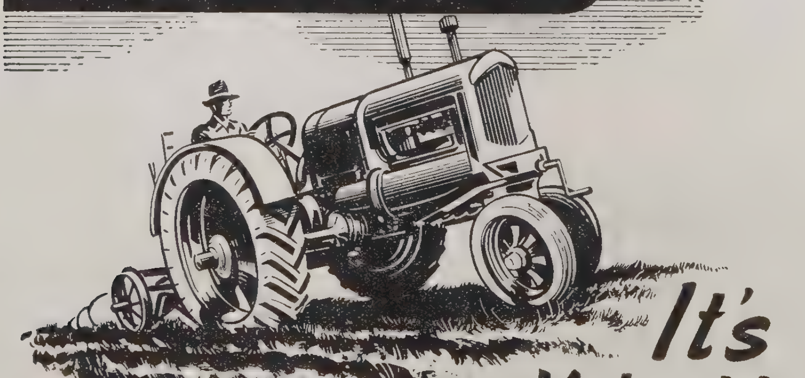

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duction of butterfat in the previous season for the months in question shall be divided by the number of cows milked during these months giving for the purposes of this agreement a standard production per cow which, multiplied by the number of cows being milked at the time of the sale, will be taken as the amount of butterfat for which payment as above shall be made.

36. A suitable area of ground shall be attached to the accommodation of sufficient size for the sharemilker to grow vegetables for his own use. Such area shall be enclosed against cattle and pigs, and where live hedges are planted around the house such hedges shall be maintained by the sharemilker.

37. The farm-owner shall decide, after consultation with the sharemilker, when the cows are to be dried off.

38. In the event of a dispute arising out of the terms of the contract, each party shall, within 30 days of either party giving notice in writing to the other, proceed to arbitration. Each party shall appoint an arbitrator who shall decide, but in the event of their being unable to agree the arbitrators shall appoint a third party, whose decision shall be final. In the event of the arbitrators being unable to agree on the third party to be appointed, the dispute shall be referred to the Department of Labour, which shall, in collaboration with the Department of Agriculture, appoint a person with the requisite specialised knowledge to settle it.

39. There shall be no reduction during the period of the contract of the area available to the herd except by mutual agreement in writing.

40. In cases where pedigree stock is raised there shall be a mutual agreement entered into between the farm-owner and the sharemilker whereby the sharemilker shall be recompensed for the extra cost incurred by him.

41. The farm-owner shall, during the continuation of the agreement, insure and keep insured the sharemilker and all the workers employed by the farm-owner against any claims under the Workers' Compensation Act, 1922, and its amendments, and shall, when required so to do, produce within 30 days to the sharemilker the policy of such insurance, and the receipt for the premiums from time to time payable thereunder, and in case the farm-owner shall make default in so doing, or shall fail to effect or keep such insurance continued, then the sharemilker may, if he thinks fit, effect such insurance or pay the premiums thereunder either in his own name or in the name of the farm-owner, and may recover from the farm-owner all the moneys paid for effecting such insurance or renewal thereof.

The sharemilker shall, during the continuance of the agreement, insure and keep insured the workers employed by him against any claims under the Workers' Compensation Act, 1922, and its amendments, and shall, when required to do so, produce within 30 days to the farm-owner the policy of such insurance and the receipt for the premiums from time to time payable thereunder, and in case the sharemilker shall make default in so doing, or shall fail to effect or keep such insurance continued, then the farm-owner may, if he thinks fit, effect such insurance or pay the premiums thereunder either in his own name or in the name of the sharemilker, and may recover all moneys so paid for effecting such insurance or renewal thereof.

42. When the sharemilker agrees to perform work outside the scope of the Sharemilkers' Agreement, he shall be paid at a rate to be mutually agreed upon in writing, but in no case shall such rate be less than 2s. 6d. per hour, and settlement for any such work shall be made quarterly. Except by agreement with the farm-owner, the sharemilker shall not undertake work outside the farm.

43. Bath to be provided at sharemilker's house, with arrangements for hot water adjacent thereto.

44. Suitable first-aid appliances shall be provided; the recommended contents of a first-aid outfit are:—

- Antiseptic solution with directions for use (a 4oz. bottle is suggested, and, in addition, an 8oz. bottle of weak tincture of iodine).
- One yard packet of plain absorbent gauze.
- One 4oz. packet of absorbent cotton-wool.
- One 2oz. packet of plain lint.
- Half-dozen 2in. by 6yd. white open-wove bandage.
- 4oz. bottle of 1 per cent. picric acid for burns.
- One 2oz. tin of boracic ointment.
- One spool adhesive Z.O. plaster 2in. by 5yds.
- 1 pair of scissors, 5½in., blunt points.
- One dozen safety pins.
- One triangular bandage.
- First-aid outfit to be supplied by farm-owner.

45. Reasonable facilities shall be given by the farm-owner or his agent to the union organiser or other official of the union to enable him to transact all business of the union.

46. Each farm-owner shall provide free grazing for one horse for sharemilker's own personal use.

Accommodation

On this particular farm, which is typical of many in Taranaki where sharemilkers are employed, the sharemilker and his wife and family live in a well-built four-roomed house, with kitchenette, pantry, and bathroom attached. Electricity is laid on providing electric light and hot water. The telephone is also installed.

The present sharemilker is Mr. C. Furze, who has recently taken over the working of this farm. A former sharemilker was employed on this property for 15 years until he left to purchase a farm of his own. In this case the owner provides the herd, and the sharemilker receives 35 per cent. of the milk cheques, also half calves and half pigs.

Buildings and Equipment

In addition to the house the buildings on the farm consist of a car shed, implement and manure shed, cow shed fitted with 5-cow milker, separator and skim-milk pump, all driven by a 2 h.p. electric motor. Hot water for washing up in the shed is provided by a 40-gallon electric heater. Other farm

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equipment consists of one 3-ton truck, mower, side-delivery rake, dump rake and stacker, topdresser, dray, sledge, and set of tripod harrows.

Layout and Shelter

The farm is all fairly easily ploughable country, but one or two swampy creeks running through it prevent a perfect layout. However, every advantage has been taken of the natural contour of the land in providing shelter, and in addition to two areas of native bush which provide wonderful shelter, trees have been planted in numerous places on the farm. A belt of pines and eucalypts has been planted on the edge of the native bush for protection from winds, and good use has been made of waste corners and waste ground in gullies. In most paddocks ground shelter is provided by barberry and *Lawsoniana* hedges.

Pasture Management

Full reliance is placed on pastures for feeding the herd, about 10 to 12 acres of silage and 30 to 35 acres of hay being the only supplementary feeds provided. The pastures are grazed in rotation as far as possible, and each year some pastures are closed up for grazing during the early spring by early-calving cows. Regular topdressing has always been practised, the whole farm receiving before the war an annual dressing of 3cwt. of phosphate plus ½cwt. of potash per acre; 5cwt. per acre of lime is applied every second year. All pastures are harrowed in the spring, mainly to spread droppings.

The value of good shelter in increasing the growing season of pastures is well illustrated on this farm, where the pastures looked much fresher after the cold winds experienced early in the winter than those on more exposed farms near the coast.

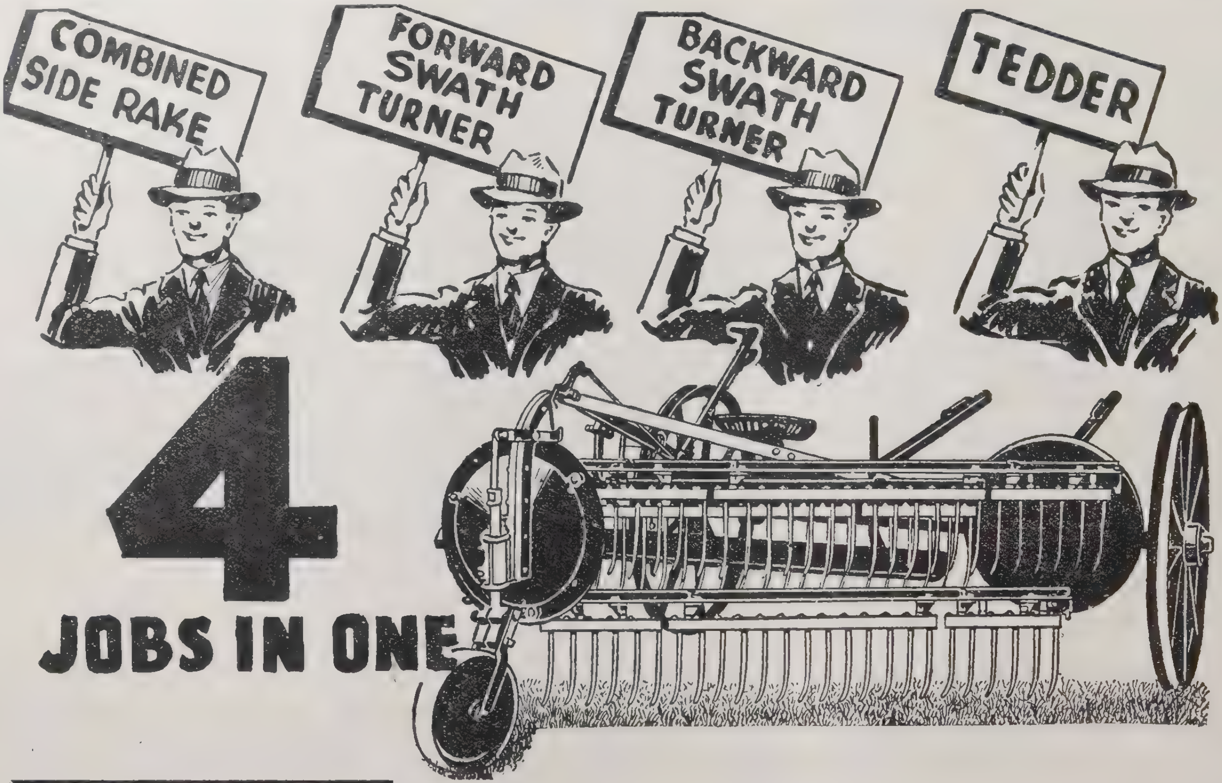
Water Supply

Water for the house, milking shed, and farm is supplied from a spring on the hills which rise steeply on an adjoining property, and a gravity system gives good pressure to troughs on all parts of the farm. Drinking troughs supply nearly all paddocks. Good running water supplies the one or two paddocks where there are no troughs. Some troughs have been built in a fence line and supply two paddocks; others are built in the centre of the field. The latter arrangement has been found more efficient, there being less chance of a "bossy" cow taking charge of the trough. A 4ft. wide base is built round all troughs preventing to a large extent a mud hole from developing.

Scene at cheese factory.

Calves winter well.

Good shelter and rugs help to keep stock healthy during cold weather.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Production and Herd Management

The carrying capacity of the farm is 110 cows, 15 yearlings, 30 calves, 2 bulls, and 4 horses. Though the 1938 production of 36,000lb. butterfat has not been reached since, it is on account of several uncontrollable factors rather than a change in management methods. Seasonal variations, reduction of fertiliser due to wartime rationing, and heavier culling to clean up disease have been the main factors. Mr. McKenzie is sure that his heavy culling has been a wise policy, however, and he hopes in the next season or two to increase production to its former level.

Herd-testing played a big part in the building up of the herd, but was discontinued during recent years when heavy culling for disease alone was necessary, but testing is to be resumed this season.

All replacements for the herd are bred on the farm. About 30 calves are usually kept, half of these being sold as weaners, and half kept for replacements.

Cream was supplied to the factory for many years, and all skim-milk was used for calf and pig feeding. Now that whole-milk is supplied for casein manufacture, skim-milk and whey are used for feeding.

Calves are fed for the first 3 weeks on whole-milk, then half skim, half whole-milk for the next 2 weeks, skim and meal for a further 6 weeks, then whey with a little meal until calves are finally weaned at about 5 months.

All calves are inoculated each year against blackleg, and practically no trouble has ever been experienced from this disease.

Pigs

The number of pigs kept has varied according to the kind of supply to the factory. When home separation was carried out 12 sows were normally kept and about 80 baconers were fattened each year. With the change-over to whole-milk supply, whey was fed to the pigs, and 4 sows only were kept, allowing about 30 baconers to be sent away during the season.

Pig management is similar to that on most farms. Sows and stores are put on to an area of grass and artichokes during the winter. Movable houses are put in the paddock for sleeping quarters and pigs have water supplied. About 2 weeks before farrowing the sows are brought into the farrowing pens, where they are fed on skim-milk and meat meal. This feeding is increased after farrowing, but is gradually reduced again as creep feeding is increased. Whey replaces some skim-milk, until at weaning all whey is being fed.

After weaning the pigs are put into fattening pens, where they are fed whey and meat meal or skim-milk and meal if available.

The farrowing pens are built next to a *Lawsoniana* hedge which provides the shelter essential for the health of sows and litters.

Conclusion

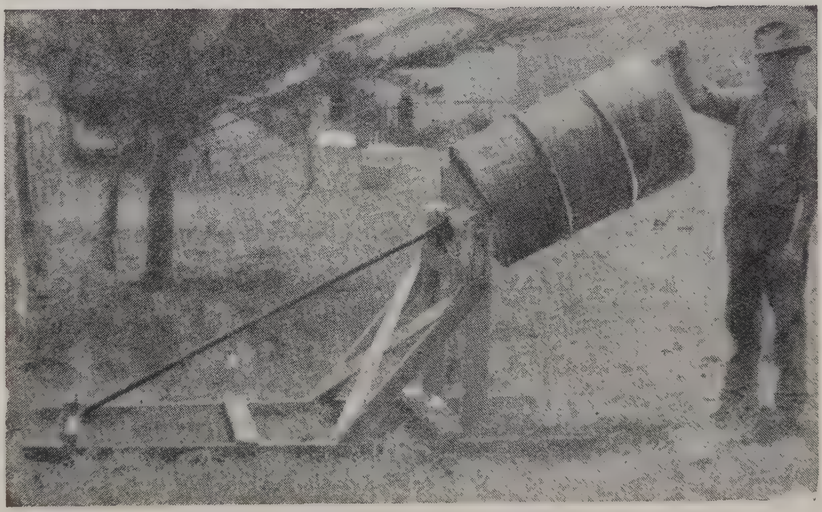
This type of farm is the ideal one for the man with a family who is not in a position to buy a farm of his own. Family labour is much more satisfactory to the farm manager than hired labour, and from the point of view of the owner such labour is ideal, as all concerned with the work on the farm have a personal interest in it, and realise that extra efforts on their part mean an increase in returns to them as well as to the farmer.

The author expresses his thanks to Messrs. R. McKenzie and C. Furze for supplying the information contained in this article.

FARMING IN THE AUCKLAND PROVINCE.

During his journeys through the Auckland Province from 1934 to 1936 Mr. P. W. Smallfield noted his observations on farming methods. His diary was considered so interesting and valuable that it has been revised and published in booklet form. The province has been divided into seven parts, each of which is dealt with individually, and there is a special chapter analysing farm management. Bulletin No. 213, "Farming in the Auckland Province," is available free from offices of the Department of Agriculture.

An Improvised Concrete Mixer



WHERE farmers have some seasonal concreting to do the improvised mixer illustrated above will be of great assistance in reducing the amount of manual work. The construction of the mixer can be fairly readily seen from the photograph, most of the materials used being quite plainly shown; the main essentials are an oil drum, some timber, and a piece of 1in. piping about 10ft. long.

The piping passes through a neat hole at each end, and just outside the drum at each end a pin should be inserted in the pipe to prevent the drum from sliding. Immediately below the drum the piping should be supported by bearings between the upright timbers, while the end of the piping should be held down to prevent the drum from tipping during mixing, and yet to permit of easy rotation in working.

The drum requires to have nearly half the top cut away for filling and emptying, and a handle fitted near the outer edge to allow the drum to be rotated by hand during mixing.

As material is mixed the drum can be emptied by releasing the foot of the piping, and using the piping as a lever to direct and regulate the flow of the mix.

The mixer illustrated was seen in use on Mr. W. Sanderson's farm at Kaitoke, Great Barrier Island.

—*C. WALKER, Instructor in Agriculture, Thames.*

WHEAT Is Still Urgently Required

The world grain position is such that New Zealand for some years to come will have to provide as much wheat for flour, and wheat offals for stock feed, as it possibly can.

Farmers in the main wheat-growing areas should immediately give attention to:—

1. Planning next season's cropping programme to include the maximum area of wheat.
2. Take the necessary steps to see that efficient land preparation is commenced in plenty of time to ensure a good seed-bed.

SEASONAL NOTES

Cereal Harvest

ALTHOUGH experience frequently has been somewhat dearly bought, recent years have seen a great advance in harvesting methods by the adoption of modern equipment and suitable varieties of grain for header harvesting. The old methods are still the most satisfactory for harvesting oats, but header harvesters have proved of great value under reasonable conditions in harvesting wheat and field peas as well as many pasture seed crops.

With grain four stages during ripening may be recognised:—

1. The milky stage when the grain contents are fluid;
2. The dough stage when the grain may be cut with the thumb nail;
3. The fully-ripe stage when the grain has hardened;
4. The dead ripe stage.

Cereals should be cut as near as possible to the correct stage of ripeness, which varies with the different varieties; grain cut too early generally tends to be shrivelled. Cereals with loose chaff must be cut earlier if risk of heavy loss by shedding is to be avoided. In a dry season ripening may be rapid, and if a large area is to be harvested, an early start with cutting is necessary.

Harvesting Wheat

Whether the crop is to be stooked or windrowed, the earliest stage for cutting without loss due to shrivelling is the dough stage. By this time, although the nodes are green, stalks are yellow with practically no other green tinge in the crop. If varieties such as Cross 7 and Tuscan are to be headed, under normal conditions they will stand 10 days or longer after this stage. Although usually tied and stooked, windrowing with the binder with the knotter disconnected is carried out to some extent with the loose chaff varieties—Hunters and Dreadnought.

The maximum moisture content permissible in a line of milling wheat is 15.5 per cent. With too high a percentage of moisture the grain is liable to heat in the bags. The Wheat Research Institute at Christchurch conducts a moisture-testing service, and farmers forwarding samples are advised by telephone or telegram as to fitness of crops for heading. Provided the moisture content is only a little too high, conditioning will take place in the sacks if these can be left standing in the paddock for a short period instead of being stacked immediately.

Oats

Oats harvested for chaff are cut with a distinct green tinge throughout the crops, slightly earlier than for a grain crop. If crops are rather green when cut, sheaves should be made on the small side to facilitate drying in the stook, or mustiness is liable to develop. Sheaves if fit will keep well in the stack even for a year or two until required for chaffing.

Good chaff is of a bright greenish-yellow colour, of pleasant smell, and with a high proportion of grain to straw. There should be about 25 bags to the ton. Average yields are slightly under 2 tons per acre.

For a grain crop no variety of oats can be relied upon to stand without loss when ripe. The crop is ready for cutting when the top grains have fallen, although at this stage the bottom grains are slightly immature.

Although unsuitable for direct heading, because of uneven ripening and shedding, oats may be windrowed and straw collected, but old methods are more satisfactory. On average oat ground yields are approximately 45 bushels per acre, and any white oat of good colour and condition weighing over 45lb. per bushel off the mill may be classed "A" for milling purposes.

Barley

For harvesting, barley requires to be ripe with grain hard and skin wrinkled. The straw should show no tinge of greenness. Usually barley is threshed from the stook, although other methods are employed successfully in certain districts. Grain with even germination and free from damaged grains and impurities is required for malting purposes, and lines are graded accordingly.

The crop is sometimes windrowed and threshed with the header, but great care is required in threshing and every precaution should be taken for even feeding, minimum drum speeds, and careful concave setting throughout the day.

Peas

Header harvesters have greatly reduced the cost of harvesting peas, but crops must be dead ripe and dry. Partridge peas are usually direct headed. This may not be advisable with Blue Prussians, White Ivories, and garden peas, which are usually cut before the crop browns off. A narrow swath may be made with the divider and guiding boards on the mower. Normally peas are ready for heading about a week to 10 days after cutting. Careful threshing will reduce the proportion of split peas, while heating in the sacks is likely to occur with peas out of condition unless due care is taken.

Old methods are still the most satisfactory for harvesting oats.

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- **CAREFUL AND REGULAR MILKING** and watching that all machines are operating efficiently.
- **WATCHING THE CREAM TEST** and adjusting the separator to ensure satisfactory separating.
- **SEEING THAT ALL COWS** are getting ample water through the hot summer months.
- **FEEDING SUPPLEMENTARY FODDER** or silage before the milk yield drops if pastures become short.
- **UTILISING AVAILABLE FERTILISER** on the best pastures.

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Although Partridge peas are generally sold as "Farmers' Dressed," garden peas are carefully machine dressed and often hand picked. Usually the best samples are obtained from stacked crops.

Maize

Maize crops are harvested during the winter, the crops being hand picked, bagged, and carted to the crib, from which they are eventually threshed.

Linen Flax

The linen flax crop, which is limited to certain areas, is mainly harvested with a flax-pulling machine. A few crops may be suitable for cutting with the reaper and binder if length after cutting is still sufficient for processing. Badly-lodged crops cannot be economically harvested for flax or seed.

When linen flax is ready for harvesting the lower third of the stems turns yellow and most of the stem leaves will have dropped. At this stage the seed will be ripe in mature seed bolls and milky in green bolls. Sheaves left on the ground for a day or two will harden and stook better. The crop may be carted to the mill or be stacked if necessary about a fortnight after pulling or cutting.

◆

Greenfeed

GREENFEED is a special-purpose crop grown for both sheep and dairy cattle. Succulent feed is required on many dairy farms for maintenance of milk production when pasture growth is inadequate during dry autumn spells and over the winter - early spring period. On arable land in late districts where spring growth of grass does not begin to come away until after lambing, some greenfeed is practically indispensable for the lambing ewes. Greenfeed is also useful for flushing the ewes a week before mating in April.

Italian Ryegrass

When a spring-sown crop is not required to follow the greenfeed, autumn-sown Italian ryegrass at about 30lb. per acre will produce excellent grazing over winter - early spring. Red clover at about 5lb. per acre should be included if sowing is not later than March, or earlier in frosty districts. After grazings, a heavy crop of Italian ryegrass and red clover hay may normally be harvested from a later-closed spring flush of feed. Temporary pastures are most useful for out-of-season greenfeed during the first year, and while permanent pastures also produce greenfeed during

Oats are the most important greenfeed cereal, providing a greater bulk of feed, particularly in early spring.

the early stages of growth, utilisation should not be at the expense of establishment. After the first year growth merely coincides with seasonal grass production.

Cereal Greenfeeds

Best results from cereals may be expected by sowing down after a summer fallow, but twitchy lea land is frequently turned over for a smother catch crop of greenfeed oats. Skimming should follow immediately after removal of a crop on stubble land, to allow for a short fallow. After working to a firm seed-bed for drilling, a catch crop of oats or barley might be sown in late January, February, or March. A late sowing should be avoided. as little winter feed will result. These autumn sowings may aim at providing against a possible shortage of roots which may be occasioned in some localities by partial failure from such causes as club root in the swede crop. It may even be desirable to cultivate the area occupied by a severely club root-infected crop which shows little promise of a satisfactory yield and sow a greenfeed replacement crop. Seeding varies according to locality—1½ to 2½ bushels are usually drilled, but in the North Island 3½ bushels are frequently broadcast and either disced or harrowed in. Cereals should be sown with phosphatic fertiliser at about 1 to 1¾cwt. per acre.

Unlike Italian ryegrass, all cereal greenfeeds are low in lime-phosphate minerals. Their value as greenfeed is limited unless supplemented by good grass or lucerne hay or with chaff and a grass run-off. For winter-early spring feeding of ewes or dairy cows a balanced ration is essential to a healthy condition for breeding. For such stock cereal straw, grass roughage, or root crops are not adequate supplements to cereal greenfeeds.

When a cereal runs to seed head the feeding value drops rapidly, herbage becomes unpalatable, and digestive troubles are likely to result. Unless saved for a grain or chaff crop, cereal greenfeed is ploughed under, generally in September, and is followed by a summer crop or pasture sowing.

Barley has the shortest season, but is the most rapid grower and under good conditions will provide grazing within six weeks after sowing. Black Skinless barley is faster growing than Cape, with very rapid recovery after grazing. but both become spindly and unpalatable earlier than oats. A succession of fortnightly sowings will prolong the feeding period.

Oats are the most important greenfeed cereal, and although slower growing than barley, the bulk of feed is greater, particularly in the early spring. From oats sown in February feed will be available from May until about September—sufficient for five or more ewes per acre if fed off in breaks with supplementary feed.

Approximately 90 per cent. of the Dominion's total area in oats is grown in the South Island. With the more general use of tractors less chaff is required for horse feed, and the total acreage in oats has dropped approximately to half the area grown 25 years ago. Over the same period the acreage grown exclusively for greenfeed has increased about threefold.

Algerian oats is the most popular variety grown for greenfeed and chaff in Canterbury. In the North Island Algerians are almost exclusively sown, because of their resistance to leaf rust, strong tillering habit, recovery under successive grazings, and prolific yields. One-year-old seed only should be sown, as new seed has a low germination from January to March. Seed lines should be free of white oats, which, being susceptible to rust, are liable to render crops more subject to rust attack.

Autumn-sown Dun oats are popular in the late districts, as they provide feed about a month later in spring than Algerians. Growth, however, is slower in winter and the total bulk of feed is less.

Although Gartons is the most popular milling oat and the main spring-sown variety, when autumn-sown it is grazed off only once, as it will not stand successive grazing.

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RESULT OF PIG COMPETITION

The following have been judged the winners of the above competition and to them we offer our congratulations.

1st PRIZE:
T. N. Forrest, Wharepaina.

2nd PRIZE:
S. K. Revell, Kaipaki.

The following are the correct answers to the five questions:—

1. Berkshire.
2. A. T. Rodgers, Mountley Stud, Ngaruawahia.
3. 150 lb.
4. 48 hours.
5. Pleurisy.

The numerous entries received were of a very high standard and we extend our thanks to those who were unsuccessful.

Autumn-sown wheat for grain is frequently fed off to supplement spring feed and increase tillering of the crop. Grazing must be done early, quickly, evenly, and only where the ground is sufficiently dry. Harrowing and rolling should follow grazing. Spring sowings of wheat are not grazed.

Emerald ryecorn is grown to a limited extent in the South Island. When autumn sown for spring feed, growth is slow until the weather is warm. The seeding required is about 2 bushels per acre. The most useful feature of ryecorn is its drought resistance, and when sown in early spring in the very dry districts it produces useful summer grazing. Maize and millet grown for greenfeed should be utilised before frosts cut them back. If not required for greenfeed, they could be suitably converted into silage.

◆

Preparing Land for Autumn-sown Pasture

INEFFICIENCY in establishment of a pasture is likely to place a limit on its production and life. Poor seed-beds and late sowings are often the result of not commencing preparatory cultivation sufficiently early. A well-prepared seed-bed is a matter of time, as well as of implements. Hurried preparation, with little ameliorating action by weathering agencies, will not ensure that fine, firm seed-bed so vital, particularly for clover, in successful pasture establishment. Loose and lumpy conditions on or below the surface result in the small pasture seeds lodging at uneven depths, under poor conditions for germination. Loose conditions are also detrimental to subsequent firm root hold by surviving plants. Weeds also have a greater chance of becoming prominent at this critical stage in the life of the pasture.

Cultivation methods vary considerably in the different districts, and under different soil and weather conditions in the same locality. The objective in all cases, however, is to produce a fine, firm, and moist seed-bed, where seed will germinate rapidly and evenly. With well-judged, timely cultivation, all deep working should be completed to allow for a suitable fallow period before sowing. During this period cultivation should be directed to compacting the soil from the bottom of the furrow to near the surface.

Periodical harrowing will firm the ground, kill germinating weed seeds, and conserve moisture. Final harrowing and one or two rollings will ensure that moisture is close to the surface for germination and rapid establishment of the pasture seeds. Cultivation practice as far as is practical should also aim to bring about levelling of furrows, finishes, and small irregularities, which will tend to produce a more even pasture sward, and result in easier grazing control due to more uniform utilisation of pasture in grazing.

If pasture is to follow rape used for lamb fattening, the fed-off rape should be disced to about 3in. in preference to ploughing, so as to retain the animal manure near the surface. Some sacrifice of second-growth rape is usually advisable rather than to face the prospect of a late sowing and risk of poor clover establishment. February-early March sowings are advisable, particularly in the South Island. Provided reasonable rainfall in early autumn is experienced, rapid establishment may reasonably be expected before the winter.

In the arable districts pastures are frequently sown after cereal crops in the autumn, and of all methods this is the least satisfactory. Usually a late sowing is unavoidable. The soil after the cereal crop may be very dry and relatively low in fertility, factors which often result in a weak, open sward, poor germination, and indifferent establishment of clovers.

◆

Cultivation for Autumn-sown Cereals

CLIMATE is the chief factor determining cereal-growing localities, and districts with heavy annual rainfall and uncertain harvesting conditions are generally unsuitable for grain production. Of the cereals harvested for grain about 90 per cent. are grown in the South Island, mainly in Canterbury, which harvests annually nearly twice as great an area as the rest of the Dominion.

The arable farmer must now consider his cropping programme for fallow and stubble land with a view to winter-early spring greenfeed requirements as well as for cash crops.

Preparatory tillage work for autumn-sown cereals should be undertaken without delay. Early ploughing makes possible well-spread and timely cultivation, which, assisted by weathering, is of great importance in obtaining good results. Sufficient time between initial work and sowing is necessary for liberation of plant food, moisture conservation, and

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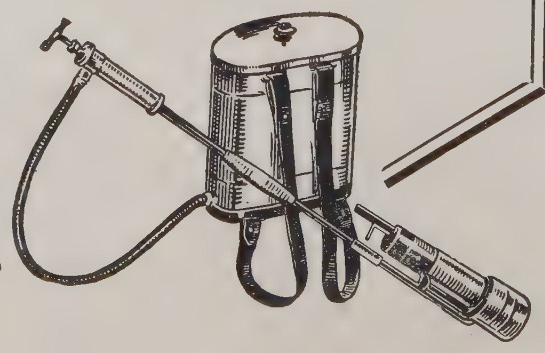

Rolling in direction of the furrow promotes rotting of the turf in cultivation after grass.

preparation of a good tilth for sowing.

A common practice in sowing wheat is to follow grass or forage crops when fertility is relatively high. Wheat also follows other crops such as peas, potatoes, or cereals when the ground can be prepared in time for sowing. Unless the land is in good heart, two crops of wheat are not grown in succession, but the second cereal crop may be oats sown in February as a catch crop for winter-early spring feed and ploughed in for a subsequent spring-sown crop. On light ground better conditions and later sowing are usually required for a crop of chaff or grain. On light land in some districts malting barley is autumn sown, but spring sowing is more usual and generally more suitable on the rather heavier soils suited to the crop. For winter greenfeed Cape and Black Skinless barley are varieties grown, a February sowing providing early winter feed. Although shallow rooting, barley responds to deep and early ploughing.

After Grass

If skim ploughing is not already done, it should be completed as soon as possible, turning a flat furrow unless dry conditions make skimming difficult, when the ploughing should be deeper and in narrower furrows. To promote rotting of the turf the furrows should be rolled down in the direction of ploughing. After about six weeks' fallow the skim should be worked thoroughly before deep ploughing about March. A firm seed-bed, fine underneath and rubbly on top, should be prepared for drilling, which will take place from about the end of April to the end of June, according to locality.

After rape or potatoes the usual cultivation practice is a single ploughing and the land worked down for a seed-bed according to conditions prevailing.

After Cereal Stubble

As soon as the previous crop is off the ground cereal stubbles should be skim ploughed, disced, or cultivated, and later on deep ploughed. As the stubble is slow to break down in the dry autumn soil, some farmers burn the straw after the header to obtain better consolidation and to destroy fungus spores of wheat diseases, but damage due to fire is a deterrent to this practice.

—*E. M. BATES, Instructor in Agriculture, Alexandra.*

CONTROL OF STOCK PARASITES

Conference in England

Mr. S. Harrowell, Managing Director for Messrs. Cooper, McDougall & Robertson (N.Z.) Ltd., Head Office at Auckland, recently returned to New Zealand after a visit to England.

The Proprietors of Cooper, McDougall & Robertson's Sheep Dips and Animal Remedies, in England, called together all Managers of their Associated Companies overseas to a conference to discuss important matters arising out of their research work in various parts of the world with regard to the application of new chemical discoveries for the control of external parasites in stock. Mr. Harrowell advises that intensive research is still in progress and, though results to date are encouraging, still further work by the Company is necessary before any definite pronouncement can be made. —P.B.A.

Book Review

"Tobacco Growing and Manufacture in New Zealand": H. L. Wise.

JUST issued by the publishers, Messrs. Whitcombe and Tombs Ltd., "Tobacco Growing and Manufacture in New Zealand," by H. L. Wise, merits the attention of all interested in the primary industries of New Zealand, not only for its reference to the particular industry around which it is written, but also as an example for the production of similar works in connection with other New Zealand industries.

In the words of the author, "there is a surprising lack of knowledge amongst the mass of the people in New Zealand regarding the industries carried on in this country," and Mr. Wise is to be congratulated on his splendid effort to enlighten New Zealanders and others on the subject of at least one such industry with which he is most familiar in his capacity as chairman of the Tobacco Board.

The work, comprising over 100 pages, gives an excellent historical review of the establishment and development of the tobacco-growing industry.

A few acres of tobacco leaf are recorded as being produced in New Zealand from the latter part of the nineteenth century onwards, but it was not until the second and third decades of the present century that the commercial aspect of tobacco production commenced to develop into significant proportions, and the author has produced a very good account of that development in his publication.

While statistical information has been kept within a reasonable limit, there is sufficient of interest to augment the wealth of information relating to the industry which the volume contains. Although production figures are quoted, one would like to have seen the figures of tobacco imports over the same period for comparative purposes in relation to the consumption within New Zealand and the effect of the growth of the industry from the viewpoint of self-reliance of the Dominion on its own industries.

However, the great quantity of reliable information which is above criticism should recommend this book to anybody interested in the tobacco industry, both producing and manufacturing, and to the general reading public too.—W.T.G.

"Tobacco Growing and Manufacture in New Zealand": H. L. Wise. Whitcombe and Tombs Ltd. 6s.

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ORCHARD AND VINEYARD

Ensuring Successful Harvest

WORK for the month of January is of a most interesting and varied nature, for while most of the "fruits" of the labour of the grower are now about to be realised in the harvest, disease control problems at this stage often become more complicated as the fruit approaches readiness for picking. The programme of work includes case making, cultivation, sowing cover crops, thinning, spraying, propping, overhaul of packing shed, picking, packing, and grading.

Stone Fruit

Careful attention to harvesting, now the principal task in the stone fruit orchard, is essential if the results of the year's labour are to be realised. Points needing attention are supply of correct containers in sound condition, picking at the most suitable stage of maturity, and careful grading and packing of the fruit.

Good type of orchard ladder for hillside work.

Cases should have been ordered in advance from miller or merchant, but if they have not been delivered, immediate attention to the matter is essential. If second-hand cases are used, they should be examined carefully and any faulty timber replaced, while all old brands must be removed from the ends. Dirty, unsanitary, or badly weather-stained cases should be discarded. The sterilisation of second-hand fruit cases is highly desirable, and a suitable method is to dip them in a solution of 2 per cent. commercial formalin (one gallon formalin to 49 gallons of water) or use one pound of bluestone to 50 gallons of water.

The standard packages for stone fruit are as follows:—

No. 4 case: Inside measurement—2½in.-3½in. x 11½in. x 18in.

No. 6 case: Inside measurement—7in. x 7in. x 18in.

No. 9 case: Inside measurement—4½in. x 7in. x 18in.

The No. 4 case is the tray, which varies in depth from 2½ to 3½in., the one with the greater depth being used for the largest size peaches. It should be noted that No. 9 case is 4½in. deep, and not 3½in., this latter size having been used last year by some who evidently thought that this case was exactly half the depth of the 7 x 7 x 18. There is another authorised package for stone fruits—a crate of any size used as a container for any number of punnets in which any stone fruit is packed—by the use of which luscious, tree-ripened peaches may be marketed in unbruised condition.

Picking

The correct stage of maturity at which to pick stone fruits varies according to the nature of the market to be supplied and its distance from the orchard. Early plums of the Japanese type may be picked as soon as they have some typical colour showing, but as the season progresses a higher percentage of colour is advisable. It is difficult to explain the optimum picking stage, but it may be defined as a stage at which a fruit picked from the tree will go on in ordinary storage and complete the ripening process so that full natural flavour is obtained and there is no shrivel or wilt. The time taken to go through this stage varies according to the type and variety of the stone fruit, and the orchardist must make a careful study of this in relation to the varieties he grows and the markets which he intends to supply. He should also keep in mind that fruit sold at auction generally has to go through the retailer's hands as well, before reaching the consumer.

Good type of picking bucket used by a stone fruit grower at Horotane.

Grading and Packing

While there are no standard grades in force for stone fruit at present, growers should keep fully conversant with any price orders which may be in operation, as the highest ceiling price is likely to be limited to fruit of the best quality, such as specially-selected dessert. At the same time the type of package in which this special fruit may be sold may be specified. Any fruit contained in packages bearing the highest grade mark should be well coloured, sound, smooth and clean, well-formed, hand-picked, uniformly mature, and free from disease, insect pests, bruises,

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preparation,
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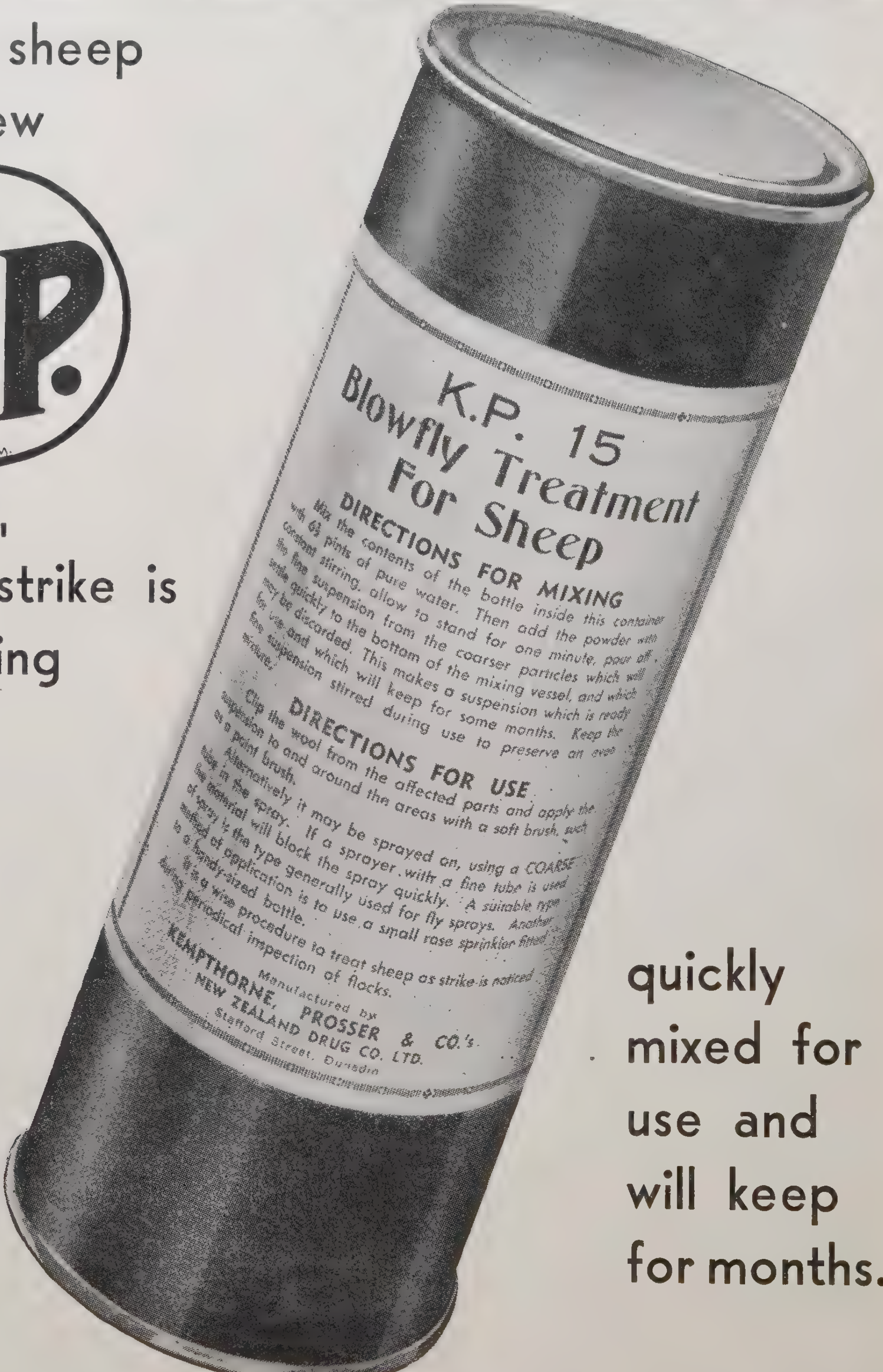

K.P. 15
Blowfly Treatment
For Sheep

DIRECTIONS FOR MIXING

Mix the contents of the bottle inside this container with 6½ pints of pure water. Then add the powder with constant stirring, allow to stand for one minute, pour off the fine suspension from the coarser particles which will settle quickly to the bottom of the mixing vessel, and which may be discarded. This makes a suspension which is ready for use and which will keep for some months. Keep the suspension stirred during use to preserve an even mixture.

DIRECTIONS FOR USE

Clip the wool from the affected parts and apply the suspension to and around the areas with a soft brush, such as a paint brush.

Alternatively it may be sprayed on, using a COARSE nozzle in the spray. If a sprayer with a fine tube is used the material will block the spray quickly. A suitable type of spray is the type generally used for fly sprays. Another method of application is to use a small rose sprinkler fitted to a handy-sized bottle.

It is a wise procedure to treat sheep as strike is noticed during periodical inspection of flocks.

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cuts, heavy blemishes, or excrescences. Fruit of the lowest grade packed and marketed should be free from insect pests and disease and serious damage caused by blemishes or cuts which are liable to affect the keeping quality.

To pack stone fruit correctly all but the smallest sizes, say under 2in., should be sized either mechanically or by hand. Boxes should be lined with paper of the clean white newsprint or coloured type specially sold for the purpose. This does not prevent bruising but does stop rubbing of the fruit on the boards and tends to eliminate case marks. The neatness of a paper-lined case has also some market value.

For peaches and nectarines which will not be harvested for several weeks a continuation of the spray programme for brown rot control (lime sulphur 1-200 plus colloidal sulphur 40 per cent., 2lb. to 100 gallons) is recommended.

Cultivation

Clean cultivation should be maintained during this month by light applications of spring-tooth or tine harrows, but towards the end of the period those deciding upon lupins for a green crop should broadcast them at 1½ to 2 bushels per acre and disc them in. On land that has become lupin sick—after a number of years of good crops lupins may no longer grow well—oats or barley should be sown.

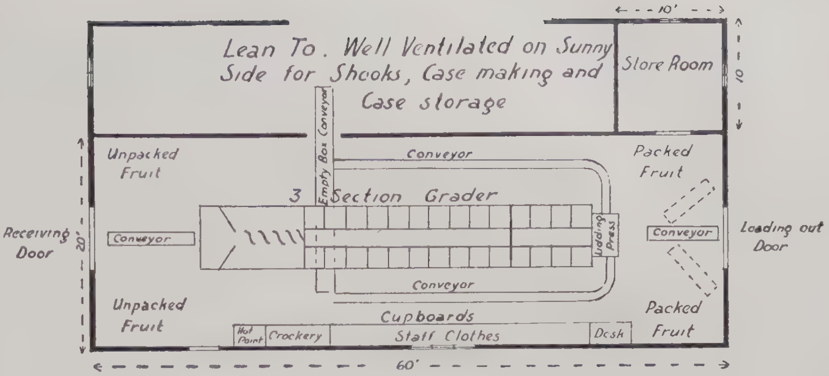
Thinning

Although the thinning of apples and pears should have been carried out in December if the best response is to be obtained, this work should be continued as soon as possible on those trees which have not been dealt with, while further attention to trees thinned earlier will no doubt reveal additional opportunities for separating clusters or lightening the load on branches not carrying sufficient foliage to size up all the fruit.

Apple and Pear Spraying

The spraying programme adopted for December should be carried on during January for the control of codling moth, black spot, and powdery mildew: Lime sulphur (15 per cent. polysulphide), 1-200; colloidal sulphur 40 per cent., 2lb. to 100 gallons; hydrated lime, 3lb. to 100 gallons; acid arsenate of lead powder, 1½lb. to 2lb. to 100 gallons.

Applications should be made at the standard interval of 18 to 21 days, but early varieties such as Irish Peach and Red Astrachan should not be sprayed close to harvesting time. This spray programme is liable to be upset, however, by an attack of red mite (*Paratetranychus pilosus*) which, if severe, will necessitate the application of white (summer) oil 1-100, two applications at a 10-day interval. It is desirable that an interval of 10 to 14 days be observed between an application of sulphur and an oil spray because of liability of damage to foliage through inter-action. As a heavy attack of red mite will rapidly weaken the foliage of apple trees, the grower is often forced to take some risk of spray damage as the lesser of two evils.



Plan of packing shed.

Cracking of Cherries Before Harvesting

A PERIOD of showery weather just before or at the harvesting of cherries frequently results in much of the fruit being cracked and unfit for sale. The following method of control has been practised in the Roxburgh district for several seasons, and is considered highly effective by all who have used it.

Should the weather show signs of breaking just before cherries mature, or while harvesting is in progress, a spray of summer oil at strength 1-80 is applied. The oil spray gives the cherries a glossy appearance and the rain is quickly shed from the fruit.

Brown rot readily enters any cracked fruit, and a reduction in the number of affected fruit by spraying with summer oil considerably reduces the degree of infection of this disease.

—K. HOCKEY, *Orchard Instructor, Roxburgh.*

Two diseases affecting apples later in the season, bitter rot (*Glomerella cingulata*) and ripe spot (*Neofabraea malicorticis*), are best controlled by applications of Bordeaux 1½-2-50 or ¾-1-50, one applied at the end of January and another at the end of February. These sprays are liable to cause slight copper injury to varieties such as Sturmer and Golden Delicious, but the extent of this is not usually sufficient to put the fruit out of Fancy grade.

Neofabraea is a disease which thrives on ripe tissue, so that varieties such as those mentioned above should not be allowed to remain on the trees longer than necessary to obtain proper maturity.

Codling Moth Tree Bands

If codling moth tree bands are of the medicated type, the larvae of the codling moth will be killed as they take cover under the bands, but if they are made of ordinary corrugated strawboard or of sacking, these should be examined now in those warmer northern districts where it is suspected that there are two broods of the moth each season. The use of tree bands must be regarded as supplementary to spraying and is of value only in orchards where the codling larvae have gained entry to fruit.

Packing Shed Overhaul

In preparation for the busy season apple and pear growers should pay careful and early attention to the overhaul and general clean up of packing shed equipment. In the off-season packing sheds often become temporary stores for orchard and farm commodities which are not in keeping with the use of the shed in which to pack an edible product.

Just as with a spraying plant a mechanical breakdown of a fruit grader in the busy season is costly in time of staff and perhaps the value of the fruit. A careful overhaul before the season commences will generally prevent these costly delays. The provision of comfortable working conditions for the packers and graders is an important item which will pay dividends in a higher output and the attraction of the best hands.

The plan reproduced is a suitable design for a packing shed which provides ample space for the installation of a two-section grader or even a three-section one of the type made in the Dominion, while still allowing space at either end for the stacking of boxes of ungraded and of packed fruit. The full production of the orchard, the size of the grader required, and the duration of the harvesting season are all factors which must be considered in determining the dimensions of a packing shed.

In districts where there is a heavy infection of codling moth it has often been demonstrated that the greatest infection is within a radius of 100 yards or so of the packing shed, which indicates that during tne previous season the moth-infected fruit was left lying about the shed too long, enabling the larvae to emerge from the fruit and take up winter quarters in cracks and crevices and inside corners of boxes. Quick and effective disposal of this fruit will assist materially in reducing the number of moths next season.

Small Fruits

In January a continuation of the harvesting of small fruits, particularly raspberries, loganberries, and black currants, is the principal work on hand. As the month is usually a dry one, irrigation may be necessary in certain areas. Most berry fruits respond to an application of water 10 to 14 days before harvesting. After the harvesting of raspberries a further application of arsenate of lead powder, 1½lb. to 100 gallons of water, should be made to control bud moth (*Carposina adreptella*), and this spray may be combined with Bordeaux 3-4-50 in orchards where cane wilt (*Leptosphaeria coniothyrium*) is known to have been present in the past. Unless intended for jam or pulp, berry fruits should be harvested in firm condition so that they will hold up for the few days before they reach the consumer. Despatch of the fruit immediately after picking should be the constant aim of the grower.

—A. R. GRAINGER, Orchard Instructor, Christchurch.

Citrus Notes

Moisture Content in Soils and Composts

To maintain citrus trees in a healthy state it is imperative that ample soil moisture be available during all periods of the year. Soils containing a high percentage of humus will hold considerably more moisture than land lacking in this respect, and the application of liberal supplies of humus around the trees is of immense value. The bottoms of used haystacks are suitable for this purpose and the mulching of trees with freshly-cut hay also assists greatly. It is advisable to do the mulching as soon as possible after the mowing, otherwise much of the moisture in the hay is rapidly dried out and its usefulness for conserving soil moisture is lessened.

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In orchards where mulching is not possible the cultivation of the surface soil should be maintained until at least the end of February to keep down weeds which are likely to be serious competitors for the limited amount of soil moisture present during the hot and relatively dry period of the year. Such cultivation should not be too frequent, as the tillage of the soil hastens the destruction of any humus present.

New Plantings

Trees required during the coming winter for new plantings or as replacements in existing orchards should be ordered from a dependable nursery as far in advance as possible. In placing such orders it is important that full details should be supplied of the trees required. The kind of root stock should be stated, also the desired variety, age of tree from budding, length of main trunk, and height of bud above ground level. It is also highly desirable that the source of bud wood used should be checked to ensure that the trees have been raised from the best-known strain of the variety. Full information on these and various other matters concerning the establishment of a citrus orchard is set out in the Department of Agriculture bulletin No. 206, "How to Establish a Citrus Orchard," which is available free of cost from all main offices of the Department.

Care of Compost Heaps

Moisture content of compost heaps that are in the process of maturing should be kept at approximately 80 per cent. of saturation. Especially during the summer months excess drying out is liable to occur, resulting in a marked slowing up of the process of decay. Where heaps are allowed to become excessively dry the full maturity of the compost may be delayed by several months.

The moisture content of compost heaps may be ascertained by the insertion of a smooth wooden pole, such as a broom handle, into the centre of the heap where it is allowed to remain for a few seconds. If, on being withdrawn, there is a light film of fine particles adhering to the pole, the moisture percentage of the heap can be considered satisfactory; if a wet slimy film is visible, the heap will be excessively wet. Should the pole appear relatively free from deposit, it can be accepted that more moisture is required. During the summer months heaps should be tested weekly for moisture content.

The moisture may be conserved in relatively dry periods by shading the heap with some material that is readily penetrated by rain, such as brush trimmings from shelter hedges. The tops of the heaps should also be flattened to prevent the rain water being run off. Water may be added to the compost by making holes 3ft. apart on the square over the top of the heap with a crow-bar. The holes should vary in depth, being shallow, medium, and deep in rotation, and approximately the same amount of water should be added to each hole. Heaps that have been allowed to become excessively dry should be completely turned, the inside being placed on the outside. The new heap should be built in layers about 1ft. thick, and each layer thoroughly watered before adding the next. Heaps that tend to remain excessively wet are best protected from the rain by some suitable covering, which should be supported a few inches above the heap to afford ventilation.

To prevent larvae of house flies feeding in compost heaps completed heaps should be soaked with a liquid fly larvicide to a depth of 2in. A mixture consisting of 5oz. commercial sodium arsenate, 7 fluid oz. molasses, and 4 gallons of water is effective. Occasional light sprayings of heaps with kerosene tends to prevent the flies from laying eggs in the compost material, but would not be effective in killing fly eggs or larvae already in the heap.

—P. EVERETT, Orchard Instructor, Kaikohe.

HOME GARDEN NOTES

Work for January

HOLIDAY haste is sometimes responsible for vegetable waste in the garden. This may be so where, prior to the holiday period, adequate care has not been taken to safeguard growing plants from the inevitable consequences of neglect. Well-grown green, leafy vegetables from which large quantities of water are transpired, particularly under weather conditions which are usual during late December and January, will readily show signs of distress unless water is obtainable in sufficient quantity. If such plants are to remain unattended for longer than the ordinary period, they should be given a thorough soaking the day before leaving them. Later the soil in the rows and around the plants can be loosened by light hoeing, which will assist in conserving its water content.

The immediate pre-holiday care of vegetable plants particularly applies to the young, immature seedlings which may only recently have been transplanted to their permanent places. The undeveloped rooting system upon which the whole plant depends for its supply of water cannot fulfil this function unless the soil moisture is adequately maintained. As these young plants may principally be those intended to supply green vegetables during late autumn and winter, their proper care should be a matter of concern, for no young leafy plant can possibly develop as it should on a short water supply. The moral is plain, and provision should be made for the supply of water to meet the needs of all the young plants in the garden during any prolonged absence.

Silver Beet, Swiss Chard, etc.

To secure well-grown silver beet, Swiss chard, or spinach beet plants which will hold in good condition throughout winter and early spring seed should be sown during January in most districts. The seed-bed is best made outside in the open ground, although a box may be used if it is of sufficient depth. If left exposed during the hot weather of January, soil used for covering seed quickly becomes dry, with the result that germination is sometimes seriously impaired. When this happens, as is too often the case, the seedsman is invariably blamed for having supplied poor seed. To prevent this happening every precaution should be taken to keep the surface of the seed-bed moist. It may be covered either with paper—newspaper will do quite well—or a piece of scrim—not sacking. If scrim is used, water can be applied on top of it without the danger of washing the seed to the surface. The best variety to grow for kitchen use is Broad White Rib (dark curled Savoy leaf).

Lettuce

High-quality lettuce are not easily grown during hot weather, but a new variety, Great Lakes, which has earned some commendation in U.S.A. for its reputed resistance to heat and drought, may be worth a trial. It is always advisable to exercise considerable caution with new vegetable varieties until they have proved as profitable to produce as those which are regularly grown. If a suitable area is available, the seed, during January, is best sown where the plants are to grow to maturity and subsequently thinned to stand 12in. apart in rows with the same spacing. If the plants removed are transplanted, plenty of water will be necessary to assist them to become established.

Tomatoes

January is a trying month for tomato plants being grown outside. Towards the end of the month well-grown plants should have attained a height of at least 3ft. with the third truss of fruit set. As the bottom truss is invariably the most valuable, providing, as it does, the first of the home-grown crop, close attention to the well-being of the plant is necessary. Leaves under the bottom fruit may be carefully removed with a sharp knife to permit better air circulation round the base of the plant and allow of easier cultivation of the soil. If any of the fruits on the bottom truss show indications of premature colouring, they should be examined for affection with blossom-end rot, which does not occur through the plant being attacked by any species of fungi or bacteria, but is stated to be due to exceptionally dry conditions following heavy rain. The plants should be kept well sprayed with Bordeaux mixture, as, during periods of high humidity, this constitutes their best protection against infection by late blight. Surplus growths must also be removed as soon as the shoots appear in the leaf axil. Keeping the plant closely tied to the stake is very important when heavy fruit is developing. If the vine is permitted to hang loosely, the weight of fruit may cause the main stem of the plant to break, which would mean stopping further development with consequent loss of fruit.

Potatoes

Early crops of potatoes the foliage of which has completely died down should be removed as soon as convenient. This recommendation is made because of the danger of the tubers starting growth, particularly after heavy rain. If the area is not to be planted with a vegetable crop for some considerable time, it may be turned over and sown with a green manure crop. Under such circumstances, sowing the seed of mustard is recommended, as it comes to maturity very quickly, but may be dug in any time.

Shallots

Well-grown shallots should be ready for harvesting in late January or early February. If it is intended to store part of the crop, the bulbs should be handled carefully during harvesting, as damaged bulbs will not keep well in storage. Stored under cool, dry conditions where there is good circulation of air, well-matured shallots properly treated during and after harvesting will keep as well and sometimes better than most onion varieties.

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should cease after the end of January. Good keeping quality in onions can be produced only when they are properly ripened. Continuation of watering after January will induce the bulbs to keep growing, which will lead to a condition unfavourable for long storage.

Late Green Crops

Seedlings of most late autumn and winter green crops should have been planted during December. Young plants set out during January will get a better start after transplanting if "puddled" in. Also it would be an advantage if the whole of the plant, except the root, is dipped in a mixture of arsenate of lead and nicotine sulphate. For the complete mixture the following ingredients are necessary: 1oz. arsenate of lead (powder), 1 teaspoonful nicotine sulphate, 2oz. hydrated lime, 5 quarts water. First mix the arsenate of lead and the lime, and, while stirring, add water to bring the mixture to a creamy consistency. The rest of the water can then be added and the nicotine sulphate last. The respective quantities may be increased or decreased according to requirements. This will give the young plants immediate protection against attacks of the larvae of white butterfly.

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Cauliflower

In districts where weather conditions are favourable there may still be time to set out a few well-grown cauliflower plants. It should be remembered, however, that true strains of cauliflower will be severely injured by frost. To obtain curds in best condition it is necessary to harvest them before the advent of wintry conditions.

Broccoli

Broccoli has been bred for hardiness, and strains have been produced which will remain in good condition through reasonable winter conditions. Because of this, it may, in many localities, be preferable to set out broccoli seedlings instead of cauliflower. Transplanting, however, should take place without delay. The plant is a gross feeder, and the fertiliser formula recommended for Savoy cabbage in the December issue of the "Journal" may be used to advantage for broccoli; the mixture should be applied generously. Planting distances between rows may vary from 24 to 30in., with 18 to 20in. between plants. The common practice of setting plants closer than the distance recommended should not be adopted; overcrowding of broccoli is certain to produce heads of inferior quality.

Brussels Sprouts

The recommendations for spacing broccoli specially apply to Brussels sprouts. Because of the length of time this vegetable remains in the garden, and the shadow cast by well-grown plants, it is desirable, where practicable, that they should be set in a single row.

Carrots

In carrot rust fly-infected areas sowing of seed in mid-January will allow ample time for the development of well-grown roots before cold weather prevents a continuance of growth. Provided no carrots are at present growing in the garden, the crop produced should be relatively free from attack by this soil pest which has become so destructive in carrot-growing areas in the North Island. Chantenay (red core, if obtainable), Earlykrop, and Champion Scarlet Horn are varieties which can be specially recommended. They are stump rooted, grow from 5½ to 6½in. in length, and when well grown are stated to mature in 80 to 90 days.

Cabbage (spring)

In southern districts seed of spring cabbage should be sown from mid- to late January. Flower of Spring is the variety recommended. Whether the seed is sown in a box or in the open ground, it is advisable to sow it in rows. If the seed-bed is made in the garden, a slightly-shaded spot would be preferable. Allowing the surface soil to become dry is detrimental to good germination. Recommendations previously made in these notes with regard to sowing seed for silver beet will be applicable to spring cabbage.

Peas

In most home gardens it may still be possible to secure full development of a crop if seed of a dwarf variety of peas is sown before the end of January; Earlykrop or William Massey should be suitable. These varieties are distinctly dwarf in habit, growing to a height of 18in., and are stated to mature in 2½ months. The soil in which the crop is grown should not be allowed to become dry, copious watering being necessary during February.

Beans

Where pods of dwarf beans are preferred to those of climbers the previous remarks on peas may be considered appropriate to beans. Canadian Wonder Improved (Burnley selection) and The Prince are quick-maturing varieties, and can be recommended for sowing in January.

Sweet Corn

In districts with high prevailing winds soil surrounding sweet corn grown in "hills" should be drawn towards the plants whenever cultivation is being carried out. Where only a few hills are grown the support which the plants receive from soil thus banked at their base may often save them from being uprooted. Sweet corn is a frost-tender plant, which makes prolific growth under warm, even hot weather conditions, but in temperate districts it produces excellent crops of high-quality cobs.

Kumaras

Because of the vine growth which kumaras should have made, weeds will not now be troublesome. If hoeing has to be done, it should be very shallow, and only to destroy the few weeds which may be growing. To prevent the vines from rooting at the nodes, as they will do if left undisturbed, they should be gently raised from the ground occasionally with a hoe handle. Tugging or pulling harshly will snap the tender vine.

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

NOTES FOR BEEKEEPERS

Preparations for Main Honey Flow

WHILE there are districts where beekeepers depend on nectar from tree-top flora for their main honey surplus, such as rata, manuka, and pohutukawa, the main source of nectar supply in New Zealand is from the clovers.

Main Honey Flow

Although varying amounts of honey are gathered between the months of October and March, the flush of the main flow lasts from 10 days to a month any time from early December to the end of January in the North Island, and a week or so later in the South Island, according to location.

Unfortunately the commencement and duration of the flow vary considerably, as the relationship of climatic influence and pasture condition is the governing factor. In some seasons there may be a series of short erratic flows or perhaps no flow at all in spite of an abundance of clover and other honey plants in bloom. Such a circumstance may be due to unfavourable weather conditions, or to low soil temperatures. On the other hand, the absence of clover bloom due to drought conditions at a critical period may have a serious effect on the honey flow.

Colony Management

As there is no certainty when the main flow will commence in any season, beekeepers should be guided from week to week (during the preparation period) by local conditions, and so endeavour to co-ordinate maximum bee population with the commencement of this flow.

While it is possible to build the strength of colonies too soon after allowances have been made for the vagaries of weather and temperatures, colonies should nevertheless reach their maximum bee population during December. The life of a worker bee is only from five to seven weeks during the honey season, and capacity brood rearing should therefore be maintained to compensate for the high field bee mortality at this time.

Colonies in a poor or backward state because of a poor or failing queen, or for any other cause, should not be allowed to continue at this time as separate units for the production of honey. They should be united by making one hive queenless and then placing above it a queen-right colony with a double sheet of newspaper between. When the bees have peacefully united into a single unit it is advisable to transfer all brood to the lower brood chambers.

Once the honey flow has commenced in earnest, swarming will not be troublesome where the hives have been provided with young queens, sufficient accommodation for the bees, and good ventilation.

Supering

Full-strength colonies will collect and store nectar very rapidly, and supering must be done on time, and in advance of the needs of the bees, or considerable quantities of honey will be lost. It is an indication of the need for an extra super when the bees begin to build new white wax on the top edges of the combs, or when the bees are congested.

When drawn combs are used a good system of supering is to place the first honey super above the brood nest, and after the bees are well started in this, to raise it and place the second honey super beneath. Where a brisk honey flow necessitates additional supers top supering at this stage will be satisfactory. This system provides the necessary comb accommodation for the distribution of fresh nectar for ripening purposes.

It is an advantage to space 8 drawn combs only in the supers used for honey storage, as the bees then extend the normal depth of the cells, providing storage for a greater weight of honey per super than is the case when the normal 10 are used. As these 8 combs are much fatter when finished, uncapping is facilitated and the subsequent beeswax yield for the season increased.

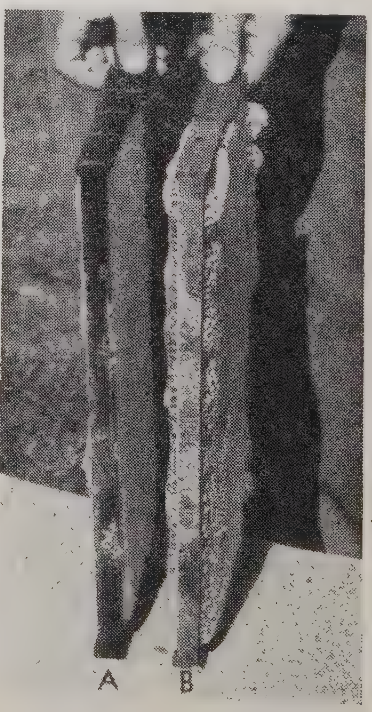
During any season, but more particularly when the flow is early and very heavy, a good stock of good empty drawn combs is one of the beekeeper's most valuable assets.

Where comb foundations have to be utilised they should be given only to strong colonies, and the number of combs given should not exceed more than the bees can draw out readily. It is good practice to place a foundation comb above the top brood chamber. To induce the bees to draw out these combs promptly and to relieve congestion in the brood chambers, two or more combs of honey with the adhering bees may be raised from the outside edges of the brood and placed in the centre of the added super. Where queen-excluders are not used these combs of honey will also assist in confining the queen to the brood nest below. The empty spaces in the brood chambers may be filled with good worker combs or sheets of comb foundation.

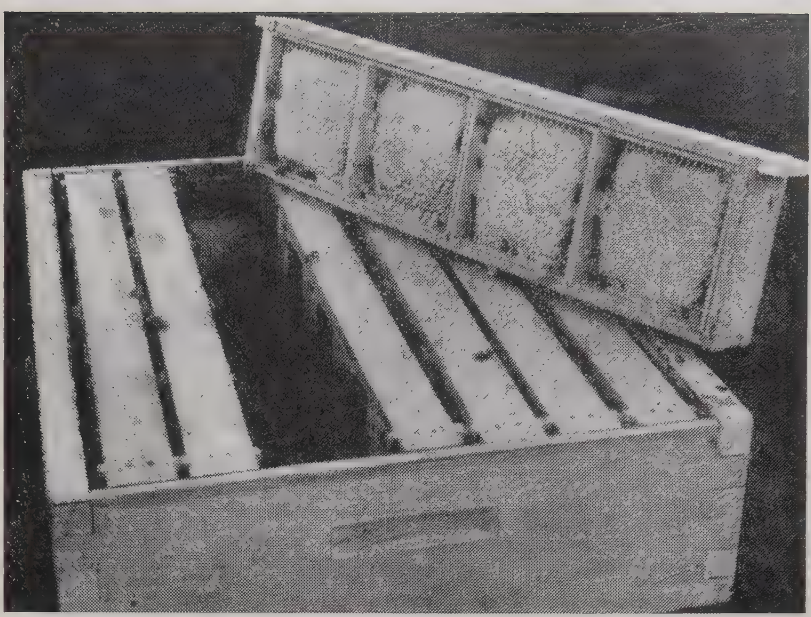
Section Honey

For various reasons commercial beekeepers operate their hives for extracted honey in preference to the production of section honey, but it would be advisable for the beekeeper with only a few hives to concentrate on producing section honey, particularly in districts where the class of honey gathered is dark in colour or is difficult to extract. A further reason is that the expense involved in the purchase of extracting equipment does not usually pay unless more than five or six hives are owned.

Wooden sections are procured in the flat, and before attempting to fold them they should be made pliable by pouring hot water on the grooves. When folding these into a hollow square—the grooves to the inside—first fasten the portion that has the bevel cut facing upwards, then bend the other part over so that it can be readily secured once the foundation comb has been inserted. Sometimes the weight of bees on the foundation pulls it from between these top pieces. To avoid this the foundation should be allowed to protrude slightly through the slot, and a hot iron run along the top edge to melt the wax



A—Result of combs spaced 9 to the super. B—Result of combs spaced 8 to the super.



Super of finished sections ready for removal.

and fasten it to the wood. The foundation should be cut to fit the sides of the square without bending and to reach within ½in. of the bottom to allow for stretch.

Where shallow or half-depth supers are used four squares are fitted into each frame with the slotted faces next to the top bar. Each super contains seven frames, but, as these fit loosely, they should be crowded over to one side of the super and wedged tightly with a piece of board cut to size. Each frame when placed in the super should have a tin separator fixed on one side, so that with the last frame the tin separator will be next to the follower board.

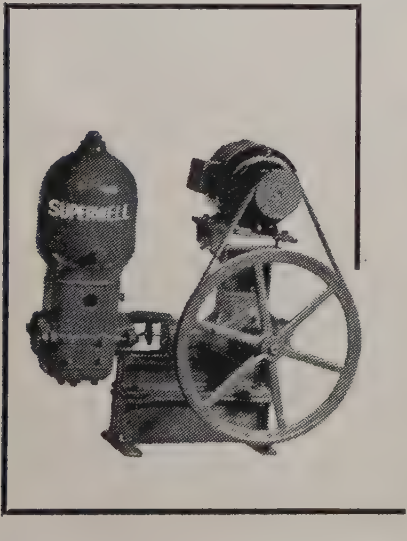
To secure the largest possible number of fancy grade sections a regular and fairly rapid flow of nectar is necessary. It is also very necessary for each hive to have both the brood chambers well crowded with a strong force of young bees headed by a young, vigorous queen.

To encourage the bees to build comb and store honey in the sections as soon as possible it is necessary to place the sections immediately above the brood nest. Manipulation of the brood will assist in forcing the bees to start work in the sections, as it is usually the lack of brood under the outside sections that causes the bees to be tardy in working them. Combs containing eggs or uncapped larvae that will be due to hatch in 12 to 18 days should be moved to the outside positions, and capped brood placed in the centre. The reason for this is that if the capped brood is located on the outsides, the cells would be filled with honey as soon as the young bees emerged, whereas when in the centre position the queen lays her eggs in the vacated cells instead, and the bees are forced to store honey in the sections above because of the absence of alternative storage accommodation below.

If all queen cells are destroyed and the brood chamber is manipulated in this manner every 10 days, a constant supply of brood will always be available below each frame of sections, and the bees will then continue to store honey in each section so long as the honey flow lasts.

When the first super of sections has been well started and there is a brisk honey flow in progress an additional super can be placed beneath the first one. Sections that are completely capped over on both sides of the comb should be removed from the hive to prevent their becoming travel stained by the bees, and replaced with new empty sections.

—*E. SMELLIE, Apiary Instructor, Christchurch.*



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Backyard Poultry Keeping

BACKYARD poultry keeping is the general term applied to the running of a few fowls by a householder who uses the eggs mainly for domestic consumption. Commercial and sideline poultry keepers are inclined to look down on backyard activities with a certain amount of contempt, but this has been brought about mainly through the unsatisfactory methods adopted by the few who give a poor name to all. Admittedly, it has to be acknowledged one sees many backyards where the hens are housed disgracefully in ramshackle pens, with dirty litter, filthy runs, primitive equipment, and inadequate diet, but the average householder looks after the birds reasonably well, while some manage their flocks with better care and attention than is given to any commercial flock.

It is argued by some that backyarders do not get as many eggs per bird annually nor as many per pound of feed as commercial poultry keepers, but there is no reason why the backyarder should not do as well and even better than large flock owners. Provided the backyarder houses his fowls well and knows something about diet, the advantages are with him, and his birds should produce more eggs than the average farm fowl.

Few people appreciate just how many backyard poultry runs there are in this country and how many eggs they produce. Of course the proportion of householders keeping fowls varies in different centres. Not many city people have sufficient ground for a poultry run, while fewer have the inclination to keep fowls. The position is different in the smaller towns and country areas, where almost every second householder keeps some hens. A recent review in Hawke's Bay showed that over 5,000 families keep a total of more than 70,000 fowls, with an average of 14 birds per run, and that nearly another 1,000 families keep almost 40,000 fowls, an average of 40 birds per run. Backyard fowls make a very considerable increase in the egg production total of this country, provide their owners with a higher standard of living both in eggs and table meat, and in many cases augment the family income.

People who desire to keep a few fowls should not be deterred merely because they consider they have no knowledge on the subject. With the average degree of common sense and recognition that poultry chores must be attended to daily, one can make a success of poultry keeping in a small way. Proper consideration must be given to housing and equipment, diet, general management, and economy of labour, but first of all a poultry keeper has legal responsibilities to observe.

By-laws and Registration

Building regulations of local authorities must be observed, and information on the building materials which may be used, the minimum distance of poultry houses from other erections, and the maximum number of fowls which may be kept can be obtained at local body offices.

Under the Poultryruns Registration Act, 1933, any person keeping 25 or more hens and/or ducks and producing eggs for sale is required to register his run. This is done by completing the necessary form at the nearest Money Order Office and paying a fee of 2/6 per 100 birds or part thereof. The registration year is June 1 to May 31.

Housing and Equipment

General information and plans of suitable small poultry houses are contained in the Department of Agriculture's free bulletin No. 211, "Backyard Poultry Keeping," which may be obtained at local offices of the Department.

In making a decision to build a laying house the following points should be kept in mind:—

1. Use good materials. The first cost is frequently the lowest cost in the long run.

2. Concrete foundations and floor will increase the cost, but will make it easier to attend to cleaning out the house and decrease trouble with rats, which is quite a factor in all cities and large towns. If the floor is built 6in. above surrounding ground level, dryness is ensured.

3. The poultry keeper has to go into the house frequently, and it should be made high enough for the tallest member of the family to stand upright.

4. At least 4in. of dry litter should cover the floor, irrespective of whether the flooring is concrete, wood, or earth. An effective and cheap litter can be made with two parts of dry garden soil, one part of coarse sawdust, and one part of chaff. At suitable intervals the litter should be sieved through a ½in. mesh and the droppings taken away. Six inches of litter to begin with will reduce to about 3in. after 12 months.

5. Nests should have plenty of depth with ample hopper space provided.

6. Guard against water being spilt from the drinking system on to the litter.

If there seems insufficient space in the yard for a laying house and a run, it is better to place more importance on the house. A run may be done without altogether and the fowls kept on the intensive system.

Diet and Feeding

Space will not permit a discussion on the merits of any special feeding system, but certain aspects must be borne in mind:—

1. Whatever feeding system is adopted, regular feeding times and habits must be kept to.

2. If the feeding system has to be changed, it should be done gradually, taking three to four weeks to make the change-over.

3. If a fresh stock of any special ingredient cannot be bought and a substitute is used, or if you get a supply of new grain, do not use all the old supply first and then commence on the new supply. At first use a large proportion of the old supply and a small proportion of the new; then every few days increase the percentage of the new supply and reduce the old.

4. A morning and an afternoon feed are quite sufficient. A midday feed is not essential.

5. Greenfeed is essential and is better fed half an hour after the afternoon feed.

6. Keep a supply of mineral grit and hard grit, which must always be available to the birds.

7. A clean supply of cool fresh water is most important. Lack of water will put fowls off the lay quicker than lack of feed.

General Management

While good housing and a good strain of birds are important, good management can make all the difference in getting the best out of fowls—and that naturally means a high egg yield per bird. In these times of better incubation and brooder facilities, up-to-date knowledge of vitamins and diet, and increased assistance to beginners through poultry associations and the Department's instructional service, the limiting factor to successful poultry husbandry is the poultry keeper himself.

1. If a fowl is worth keeping, it is worth feeding properly. Do not under-feed your birds.

2. Give them as much as they can eat in 30 minutes. Go back to the pen after half an hour and see whether they have eaten all the feed or left some. Work your next feed accordingly.

3. Keep the house clean.

4. Take precautions against permitting the run to become poultry sick.

5. Remove sick birds from the pen. If a fowl is obviously ill or goes light in body weight, **always kill it and do not attempt treatment.**

6. Keep the house free from red mite and the birds free from lice and intestinal worms. These parasites make a bigger difference to egg yield than many people appreciate. If you do not know how to cope with them, consult the Poultry Instructor for your district.

7. Cull out all unproductive birds, whether pullets or hens. Again, the Poultry Instructor can assist you.

8. Do not keep both hens and pullets in the same pen.

Economy of Labour

One factor which deters so many people from keeping a few fowls is that the wife, through household ties, cannot spare time to look after them and the work falls on the husband, who has to observe regular business hours. Another is that fowls have to receive attention seven days in the week, 52 weeks in the year. These two factors should be kept in mind both when the house is being erected and a decision being made on the feeding system to be adopted.

Wet mash feeding takes the longest time. Soaked grain feeding is next. Dry mash feeding from a hopper has the advantage of enabling the husband to fill the bin once weekly, during the weekend.

A weakness of dry mash feeding is that so many backyarders who have not the time or the knowledge to compound their own mashes buy them ready mixed, without being able to ascertain the constituents. Fowls do not require the same protein proportion all the year round. Mash manufacturers may not vary the meatmeal percentage for the different seasons. For these reasons, quite apart from the present temporary difficulty of obtaining supplies of pollard, bran, and maizemeal, there is much to say in favour of a whole, dry grain feeding method. Under this system two grain feeds are given daily at the rate of 10-11lb. per 100 birds at each meal or approximately 1¾oz. of grain per bird at each meal. A mixture of 60 per cent. wheat, 20 per cent. maize, and 20 per cent. barley or oats is recommended. In addition a free supply of meatmeal should always be available to the fowls in a dry mash hopper or a suitable box. Throwing the grain among the litter gives the hens some exercise, provides them with some occupation during the day searching for lost grains, and keeps the litter looser and drier through having it turned over frequently. By feeding this quantity of grain the birds are encouraged to help themselves to roughly the correct quantity of meatmeal required to effect a balance between the intake of protein and carbohydrates.

Troughs, hoppers, nests, and drinkers should be designed to effect economy in cleaning and attending to daily chores.

Fundamentals

In carrying out poultry keeping activities the following points should be kept in mind:—

1. Buy a good strain of pullet. It is better to pay extra for quality. It is usually a better proposition for backyarders to buy "perching" or "near the lay" pullets rather than day-old chicks.

2. Keep the fowlhouse wild bird and vermin proof.

3. Maintain cleanliness and consider your neighbours.

4. Store the feed in metal containers.

5. Do not overcrowd the birds or use the excuse that the fowls have a run.

6. Above all, do not look upon the fowls as mere pets. Certainly treat them with all possible consideration and care, but remember that they are kept for egg production. All healthy birds not doing their duty should be killed and eaten.

Culling

Do not fall into the error of believing that all fowls are suitable for keeping for two laying seasons. On the other hand, do not contend that no fowl is worth retaining beyond two years.

Culling should commence when the chicks are taken out of the incubator and should be carried out continually during the rearing and laying seasons. From "type" alone any poultry keeper should be able to pick out the best layers and the non-layers. If you are not able to cull the next lowest grade, the poor layer, get someone to do it for you or contact the local Poultry Instructor. If your poultry house is large enough to house 12 fowls, keep 12 good ones. It costs very little extra to feed a heavy laying fowl than it does a poor one.

Keep pullets and hens with good "capacity"—length of back, depth of front and abdomen, and ample width. Judge health and stamina; examine the head and eyes; feel the bone formation; take weight into consideration; discard overfat birds. A "light breed" pullet should generally weigh 2½lb. and a hen 5lb., while "heavy breed" pullets should be about 6lb. and hens 6½lb.

Rearing Chicks

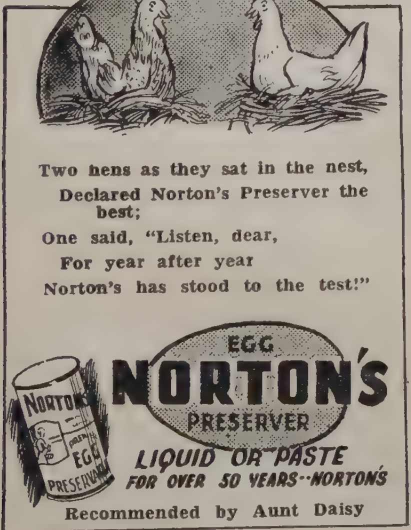
Those interested in chick rearing are referred to bulletin No. 199, "Chick Rearing," price 6d., which may be had post free from offices of the Department of Agriculture.

—*W. L. McIVER, Poultry Instructor, Hastings.*

Chick-sexing Examination

FIVE candidates presented themselves for examination for chick-sexing certificates at the Animal Research Station, Wallaceville, on October 24, 1945. No candidate obtained the 95 per cent. efficiency required for a certificate. The names of the candidates and results of the examination are as follows:—E. Parkinson 87 per cent.; D. R. Bethune 89½ per cent.; W. S. Borich 88½ per cent.; J. H. Fletcher 89 per cent.; B. M. Gabites 86 per cent.

The address of R. H. Winter, who was announced in the October issue as having been granted a chick-sexer's certificate, was wrongly given. His correct address is Box 68, P.O., Hastings.


Two hens as they sat in the nest,
Declared Norton's Preserver the best;
One said, "Listen, dear,
For year after year
Norton's has stood to the test!"

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PRESERVER
LIQUID OR PASTE
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Meeting of Dominion Executive Committee

A MEETING of the Y.F.C. Dominion Executive Committee was held at Christchurch on Thursday, November 8, delegates being present from all four councils. The following attended the meeting: Messrs. F. S. Atchison (Dominion President); Jas. Barclay (Vice-president); T. E. Streeter (Immediate Past President); W. F. McLaren (Past President and a Patron of the Federation); D. S. Ross (Past President and Auckland Council delegate); J. M. Smith (Director of the Fields Division); W. A. Young (Chairman, Otago-Southland Council); J. L. Sunderland (Chairman, Wellington Council); R. P. Connell (Fields Superintendent, Dept. of Agriculture, Christchurch); J. H. Bremner (N.Z. Farmers' Union); W. A. Jacques (Massey College); L. W. McCaskill (Lincoln College); A. B. Stewart (Otago-Southland); H. L. Hyland, R. Inch, S. A. La Roche (Canterbury); S. G. Avery, S. J. Avery, MacGregor Donald, H. A. James, D. G. McLachlan, I. G. Tabor (Wellington); C. W. Eyre (Auckland); and S. Freeman (Dominion Organising Secretary).

Memorial and Land Settlement

Before the meeting there was a meeting of the sub-committees set up to deal with the Y.F.C. Memorial and the Y.F.C. Land Settlement scheme. It was hoped that some finality on the Y.F.C. Memorial could have been reached, but it had been impossible for the sub-committee to meet earlier. There had been a number of new suggestions of the form the memorial should take, and it is necessary to give careful consideration to these as well as to the previous ideas. The sub-committee arranged to meet again in Wellington before the end of January and to bring down recommendations to a February meeting of the Dominion Executive Committee, at which it is hoped that finality will be reached.

It is realised generally that very little can be done for some time about the Land Settlement scheme, but every effort is being made to acquire as much information as possible, both regarding the type and urgency of the young farmers' own requirements and the availability of land. A recent questionnaire sent out to all clubs met with a comparatively poor response, and it will be necessary to gather further information; it is hoped that the matter will be treated with more seriousness by club members, as the whole scheme is of national importance.

The Dominion President, Mr. F. S. Atchison, of Clevedon, Auckland, extended a welcome to the members and delegates, and particularly to Mr. J. M. Smith, Director of the Fields Division of the Department of Agriculture. The presence of the President, Vice-president, and three Past Presidents of the Federation—himself, Messrs. Barclay, Streeter, Ross, and McLaren—constituted a record, and showed the interest that was being maintained in the organisation. He referred to the progress being made by the movement throughout the Dominion and the future of the organisation generally.

Membership Objective

The Dominion Organising Secretary dealt with each of the 36 District Committee areas in turn, and summarised the position as follows: Auckland Council (12 districts), 43 active clubs, 39 still in recess; Wellington Council (11 districts), 45 active clubs, 43 in recess; Canterbury Council (7 districts), 30 active clubs, 21 in recess; Otago-Southland Council (6 districts), 25 active clubs, 28 still in recess. Totals: North Island (23 districts), 88 active clubs, 82 still in recess; South Island (13 districts), 55 active clubs, 49 in recess. Dominion totals: 143 active clubs, 131 still in recess. At the outbreak of war there were 208 clubs operating throughout the Dominion—today there are 143, with 131 of the old clubs still inactive, a total of 274 clubs active and in recess. The difference in the totals was accounted for by the fact that 66 entirely new clubs had been formed during and after the war, the majority during the past 6 or 8 months, with the revival of a number of the older clubs. The present active membership was estimated at about 4,000, compared to the pre-war membership of 6,000. At the present rate of progress there would be about 300 clubs with a membership approaching 10,000 by the end of next year. The goal of 25,000 members in 800 clubs that he had suggested at the annual general meeting might not therefore prove so very difficult of achievement, and could be adopted as the federation's "five-year plan"!

President's Christmas Message

I TAKE this opportunity to send seasonal greetings to all members of our Young Farmers' Clubs movement throughout New Zealand. We are indeed thankful that the war is past, but we should all of us realise the magnitude of the task that lies before us of assisting in the building up of a world in which the recurrence of such strife and destruction should be an impossibility. There are many grave difficulties to overcome, but we must face them with courage, determination, and fortitude. If we can bring ourselves to a true appreciation of our own responsibilities, we shall go far towards the establishment and maintenance of the peace for which so many of our members have fought and suffered. Our own movement represents one of the freedoms for which our comrades have so manfully striven, and it is the duty of all of us to see that the Young Farmers' Clubs organisation extends and progresses throughout our Dominion, to become one of the greatest assets the country has ever known.

Our movement has shown its importance in pre-war days and it has demonstrated its value and capabilities during the war by carrying on in the face of difficulties and adversity. Nearly three-quarters of our clubs were forced into recess through depletion of membership. We have now turned the corner, and our organisation is well on the highroad to recovery, with nearly 150 strong, active clubs operating throughout the Dominion, with approximately 4,000 members. We must take advantage of every opportunity to revive all the old clubs that are still in recess and form new ones wherever possible, so that every young farmer may in the future receive to the full the benefits which we have enjoyed in the past. The potentialities of our movement are so immense that we would be failing in our duty to our fellows by neglecting to develop them. . . .

We owe a debt to those who have fought for us; we have also a responsibility to the younger generation. New Zealand depends upon its primary production, and it is up to young farmers to safeguard the future. . . .

—F. S. ATCHISON, Clevedon, Auckland, Dominion President, N.Z. Federation of Young Farmers' Clubs (Inc.)

The chairman referred to the recent death of Mr. C. H. Schwass, Assistant to the Director of the Fields Division, who for a number of years had acted as hon. treasurer to the Y.F.C. Federation. The meeting expressed the deepest sympathy with the relatives of the late Mr. Schwass.

Mr. S. G. Avery (Wellington Council) submitted a report as delegate to the recent annual conferences of the Women's Division of the Farmers' Union and the Women's Institutes, which he attended to put forward proposals for the establishment of a rural young women's movement similar to the Y.F.C. organisation. Both of the women's organisations had appointed delegates to meet the special sub-committee set up by the federation in an endeavour to sponsor this "sister" movement to the Y.F.C.

Reports were received from the sub-committees set up to deal with the Y.F.C. Memorial and Land Settlement schemes and with literature and propaganda. Y.F.C. representation on the following bodies was discussed: Federated Farmers', National Pig Industry Council, the Farms Advisory Committee of the Rehabilitation Board, and the Dominion Executive of the Junior Chamber of Commerce.

Department's Help

Mr. J. M. Smith, Director of the Fields Division, congratulated the federation on the manner in which the organisation had been held together during the war and the progress made during the past year. He stressed the value of the Y.F.C. movement to the individual members, to the farmers, to the Department of Agriculture, and to the nation as a whole, and stated that the Department was wholeheartedly behind the movement. Shortage of staff and extra duties imposed during the war had considerably curtailed the Department's active assistance to the organisation, but these difficulties were already being gradually overcome. A number of instructors had resumed their activities as district Y.F.C. secretaries and had already been responsible for the revival of many clubs, and new instructors were being appointed as opportunity offered. The position of the Dominion Organising Secretary was being placed on a better basis, and provision was being made for the appointment of an assistant secretary in the near future.

It was decided to hold a competition open to Y.F.C. members for the best designs for the proposed badges for the Dominion President, Vice-president, and Past Presidents, each competitor to submit three designs, and a prize of one guinea to be awarded for each design.

Mr. Smith gave details of a proposal whereby clubs, with the approval of the Dominion Executive Committee, would be asked to cooperate with the Department in the preparation of maps in connection with regional planning. These maps were intended to indicate the present and potential productivity of the various districts, and when completed would be of value both to the Department and to the clubs. He referred to two clubs in the Manawatu which had already undertaken this project. The chairman said that clubs in the Auckland district were particularly interested, and the meeting agreed to endeavour to implement the proposal.

Remits Carried

The following remits from councils were among those carried:—

"That the Department of Agriculture be asked to replace the movie projectors in the various centres as soon as possible" (Otago-Southland); Mr. Smith, on behalf of the Department, stated that the matter was already in hand.

"That the Department be asked to provide more space in the Y.F.C. section of the 'Journal of Agriculture'" (Wellington and Auckland); the secretary said that provided the material was of sufficient interest and value, the Editor had agreed to provide further space.

"That the federation provide District Committees with slides to advertise the Y.F.C. movement at cinema theatres" (Auckland).

"That more frequent meetings of the Dominion Executive Committee are desirable, especially within one month of the annual general meeting in order that matters referred to the Dominion Executive Committee by the annual general meeting and matters raised by the councils may be expedited" (Canterbury).

"That inter-council and inter-Island debates be resumed at the first opportunity" (Canterbury).

"That copies of all Y.F.C. radio talks broadcast from all New Zealand stations be forwarded to the Organising Secretary for filing and reference" (Wellington).

"That the Dominion Executive Committee consider the advisability of adopting the Y.F.C. library scheme as proposed by Massey College" (Wellington); the scheme was outlined by Mr. W. A. Jacques, who undertook to supply further details of costs, etc., at the next meeting of the Dominion Executive Committee.

A remit from the Wellington Council requesting "that a name be given to the Y.F.C. Memorial Fund and a target set as a sum to be raised and allocated in quotas to the councils" was referred to the memorial subcommittee.

Mr. D. S. Ross stated that it was apparently the feeling of the Minister of Agriculture that, in view of the proven value of Primary Production Councils, it was desirable to set up some other organisation to take their place on their disbandment. His motion that the federation should approach the Minister for representation on such an organisation was carried, and it was left to the President and Mr. Ross to arrange a suitable delegation.

The next meeting of the Dominion Executive Committee was tentatively fixed to be held in Wellington in the third week in February next.

Wanganui District Debating Contest

In spite of many attempts to get the Wanganui district debating contest over in good time this year, the final debate was not held till October 13, largely because of unwillingness of members generally to take any active interest in the debating, and club secretaries had difficulty trying to fill the teams which the clubs were prepared to enter. Once the ice has been broken, debating is not half the ordeal that many seem to think it is.

When all the entries had been received, it appeared that the contest would be a very good one; four clubs entered teams as follows:—Marton, 2 senior, 1 junior; Bulls, 2 senior, 2 junior; Hunterville, 2 senior, 2 junior; Mangaweka, 1 senior, 1 junior. Had all these teams been able to take part, the contest should have proved most interesting, but the ultimate number of teams which actually competed was reduced by half. As was the case last year, the district was divided into two zones, Marton and Bulls in the south and Hunterville and Mangaweka in the north. Unfortunately Mangaweka were eventually unable to compete, so that Hunterville had no debates till the final. In the southern zone the Marton juniors withdrew, which put the Bulls juniors into the final, and as they were unable to get their teams together so late in the season, Hunterville won the Bartosh Cup by default.

The senior class in the southern zone was more encouraging, the two teams from each club taking part. The subject for the first round, in which there were two debates, was "That it is Sounder Economy to Improve the Carrying Capacity of Existing Grassland than to Bring New or Derelict Land into Production." In the first debate between the senior B teams from both clubs Bulls supported the motion, and after an interesting debate, which was not without its lighter side, were awarded the decision with 273 points out of 400, as against Marton's 255. The second speaker for the Bulls team, S. G. Avery, was adjudged the best speaker for the evening, gaining 84 points out of 100. The teams were: Bulls: F. J. Thorby, S. G. Avery, and H. Clark. Marton: D. I. Morrison, A. L. Vile, and H. R. Miller. Mr. N. V. Rix-Trott, of Marton, was the judge, and the chairman and timekeeper were Messrs. J. L. Sunderland and A. V. Lithgow, chairman and secretary respectively of the Wellington Y.F.C. Council.

The subject for the senior A teams was the same, but Marton had the affirmative, taking the opposite side to their B team. The debate was very keen. Marton won by 11 points, scoring 274, and Bulls 263. The teams were:—Marton: M. F. Gray, G. E. Gordon, and D. R. McFarlane. Bulls: R. I. Jamieson, C. Bowen, and P. Anderson. The leader of the Marton team was adjudged the best speaker, gaining 74 points. The judge was the Rev. N. Williams, and the chairman and timekeeper was Mr. E. B. Gordon, M.P.

The final in the southern zone, which was also the semi-final for the contest, was between Marton senior A and Bulls senior B, the subject being "That the Natural Product is of More Economic Value than its Synthetic Counterpart," Bulls taking the affirmative. Marton won by 5 points, the totals being 250 and 245. The teams were:—Marton: M. F. Gray, G. E. Gordon, and D. R. McFarlane. Bulls: S. G. Avery, J. F. Thorby, and H. Clark. Mr. Gordon was adjudged the best speaker by Mr. K. A. Williams, who allotted him 69 points. The chairman and timekeeper was Mr. K. G. Coles, of the Marton Club (chairman of the Wanganui District Committee).

Among those present at the final debate was Mr. H. C. Kimpton, recently returned from service with the R.N.Z.A.F. in England, and who is the donor of the district senior trophy. The subject "That our System of Intensive Grassland Farming is in the Best Interests of Our National Heritage" was supported by Hunterville (J. Lilburne, G. B. Husband, and H. England) and opposed by Marton (M. F. Gray, D. R. McFarlane, and G. E. Gordon). Speakers were apt to get away from the subject, and the debate lacked the punch of the final debate between Marton and Mangaweka last year. The Marton team's margin of 26 points was due to the inexperience of their opponents, who lost many points through not making full use of the time allotted to each speaker. It is a pity that no debates had been held in the northern zone, for in that case the winners of that section would have been able to contest the final with more confidence, and the debate would have been more satisfactory from all points of view.

At the conclusion of the teams debate several new points were brought up and several criticisms made in open debate. Mr. Geo. McDonald, Rata, thought there was a reasonable prospect of our system of intensive grassland farming proving to be in the best interests of our national heritage. The judge, Mr. R. M. S. Jones, considered that both sides had failed by not defining the subject sufficiently, taking it for granted that the audience knew what they were talking about. In this respect he would have given Mr. McDonald full marks for subject matter, despite the short time he spoke. The timekeeper was Mr. W. C. Smith, of Hunterville.

For the teams which took part the contest was of great value, and the importance of the lessons taught by these contests cannot be overrated. It is hoped that next year far greater interest will be taken in debating among the clubs and that inter-district and inter-council contests will be commenced. Prospects in the Wanganui district are good, for there is one new club in Wangaehu, and the Waimarino Club has resumed activities, and there are indications that in 12 months' time there will be one or two more in the field. Competition for the junior trophy for the last two years has been very disappointing, and clubs will have to make an effort to enrol more junior members. The results for the 1945 Wanganui district contest are:—Senior (Kimpton Cup)—Marton. Junior (Bartosh Cup)—Hunterville.

—MALCOLM F. GRAY, Vice-chairman,
Wanganui District Y.F.C.

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Mid-Canterbury Stock Judging

Mid-Canterbury annual stock-judging competition. Some of the competitors judging Romneys.

THE Mid-Canterbury District Committee held its annual stock-judging competition recently at "Longbeach," over 70 young farmers taking part. The Hinds Club organised the competition, Corriedale sheep being provided by Mr. J. H. Grigg, and Romney sheep by Mr. F. P. Cookson, who also judged the respective classes.

J. Cleland (Ashburton High School Y.F.C.) gained most points in the individual competition, with R. Kingsbury as runner-up. At the close of the competition the judges gave instructive demonstrations on the various sheep, and answered many questions. The Y.F.C. movement in Mid-Canterbury is fortunate in having stock breeders of this calibre to interest themselves in the clubs and give such valuable instruction to the members.

—R. INCH, District Y.F.C. Secretary,
Ashburton.

Canterbury Inter-district Debate

MID-CANTERBURY monopolised the honours at the inter-district debate of Young Farmers' Clubs held recently at Ashburton, winning both senior and junior sections. The competitors were winners of the inter-club competitions in their respective districts throughout Canterbury.

Mr. A. McKay, of the Methven Club, presided over a good attendance. The timekeepers were Messrs C. C. Werry and H. L. Hyland.

With a view to making the speaking more interesting, the senior section was held in two divisions. Representing Mid-Canterbury, Hinds won on the negative of the subject "That the future of New Zealand demands a vigorous back-to-the-land policy." The winning team (W. Taylor, leader; A. McKenzie, and K. McConnell) beat Pleasant Point (J. Crombie, A. France, and J. Skinner), representing South Canterbury, by 270 points to 239.

The subject of the other senior debate was "That co-operative farming would be beneficial to the future welfare of New Zealand." The negative team, Scargill-Omihi (North Canterbury), comprising G. Maxwell, G. Gardner, and H. Symonds, beat Ellesmere (Christchurch) by 216 points to 197. The Christchurch team comprised S. Ford, B. Christie, and E. Overton.

The junior debate on the subject, "That large farms are more profitable than small farms," was won by the Ashburton Club, which took the negative. The team (F. Amos, leader; H. Bennett, and F. Greenslade), beat the Geraldine team (J. Sheed, leader; W. Little, and N. Goodwin), representing South Canterbury, by 220 points to 186.

The judges, Messrs. E. J. Wood and R. G. Ross, expressed satisfaction with the general standard of speaking, and gave helpful hints to less-experienced speakers. Mr. Wood said that W. Taylor, of Hinds Club, was the best speaker.

Mr. S. P. Taylor thanked the judges and praised the enthusiasm of the clubs.

The visitors were shown over a grain store and were conducted over the Inchmore irrigation area by Mr. G. G. Calder, Instructor in Agriculture, Ashburton.

—R. INCH, District Y.F.C.
Secretary, Ashburton.

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North Canterbury Field Day

OVER 100 members of Young Farmers' Clubs in the North Canterbury district took part in a district field day held recently under ideal weather conditions.

The itinerary was arranged by Mr. E. G. Smith, of the Department of Agriculture. At the conclusion of the day the thanks and appreciation of all who took part were conveyed by Mr. H. M. Cooper, chairman of the District Committee, to the officers of the Department for their efforts in making the day so interesting and enjoyable.

Mr. Smith said that the splendid attendance of members, many of whom had travelled 60 to 70 miles, was evidence of the keen interest in the movement taken by members of all clubs in the district.

Assembling at Rangiora, the party proceeded to a farm at Swannanoa where an area of H1 ryegrass was inspected. Mr. Smith explained the merits of this new high-producing strain of pasture grass. The owner of the farm then gave a talk on Southdowns followed by a demonstration of the methods of judging.

A judging competition was held on two pens, each of four Southdown ewe hoggets. Keen interest was taken in this competition, and generally the papers handed in showed that a majority of the young farmers possessed a sound knowledge of sheep. The owner judged the sheep and gave his reasons for placing them in order of merit.

In winning the competition, A. Stewart, of the Hawarden-Waikari Y.F.C., also won the North Canterbury District Young Farmers' Stock-judging Cup donated by Mr. H. G. Parish.

Mr. Cooper thanked the owner of the farm for giving a demonstration, for his cheerful co-operation, and for all he had done to make the visit so interesting and instructive.

Members were later shown over the Kaiapoi Woollen Mills and the Belfast Freezing Works.

—E. C. WITHELL, District Y.F.C.
Secretary, Rangiora.

Blood Donors

THE Franklin Young Farmers' Club recently decided to volunteer as a body to donate blood to the blood bank of the Auckland Hospital.

The need for blood in the various hospitals is very real, especially in those where overseas servicemen are receiving treatment. Blood is also used extensively in operations and accident cases, and it can be said that the use of transfusions has saved countless lives in our own country and abroad.

Before giving the blood the club members were addressed by Dr. G. Cairns, of the Auckland Hospital. When giving blood the donor's arm is bared and a local anaesthetic given in the crook of the arm. A hollow needle is then inserted into the large vein in the arm. The operation of obtaining the blood normally requires five minutes, and the donor clenches and unclenches the fist to promote the flow of blood into a sterile container. No discomfort was experienced while giving the blood, and members all reported that they felt no ill effects the following day.

Approximately 25 pints were donated—sufficient for three days' supply at the Auckland Hospital.

This worthy cause is commended to all clubs who feel that they could help by becoming blood donors. No one knows who may be requiring blood next; it may be a loved one or a serviceman who has given more than a pint of blood for you! Clubs can rest assured that their donation is sorely needed, as in many cases little or no reserves are able to be maintained. In most cases the St. John Ambulance will arrange for this work to be carried out.

—L. W. ALDRIDGE, Club Reporter,
Franklin Y.F.C.

Lecture Brevities

Impromptu Speaking: Mr. N. V. Rix-Trott.

THE vast majority of farmers were unable to voice their ideas in a coherent way, if they spoke at all, and often came away from a meeting having seen a motion passed which was contrary to their opinions simply because someone else was a good orator and got away with it, Mr. Rix-Trott told the Marton club recently. The general grumble is that the wrong men are in the responsible positions in farmers' organisations; but as often as not they are there simply because they can get up on their feet and talk. Mr. Rix-Trott said that he considered the ability to speak to a motion, even if only for a couple of minutes, was of immense importance, because it made a meeting all the more interesting, and it ensured that all points of view would be brought forward. How often during a discussion did a half-minute's pause bring a general buzz of conversation, each member giving his opinion to those on either side of him. The ideas are obviously there, but it only remains to voice them at the opportune moment.

Mr. Rix-Trott's advice was to speak simply and persuasively, and not to be afraid to pause to collect one's thoughts. That pause may seem an eternity to the speaker, but not unnecessarily long to the audience. He said that members would do well to tune in to the House of Representatives when some of the more accomplished speakers were on the air.

He suggested that each member should choose a subject, preferably one associated with farming; these should be put into one hat, and the names of those present into another, and drawn at random by the chairman. The experiment proved entirely successful, and although subjects are liable to be double-banked, this is no drawback, as everyone has different ideas, and members derive much benefit from hearing all points of view. The club can confidently recommend this scheme as being a most satisfactory one.

—MALCOLM F. GRAY, Hon. Sec.,
Marton Y.F.C.

Marton Y.F.C. at Massey

A PARTY of 22 members of the Marton club which recently paid an official visit to Massey College was welcomed by the principal of the college, Professor G. S. Peren, and by the literary officer, Mr. L. A. G. Barrett, who, assisted by Mr. Alec. Rae, lecturer in animal husbandry, conducted the party round the college.

Mr. Barrett gave a brief resume of the work being carried out by the college before showing the party the very fine assembly hall, the various lecture rooms and laboratories, and the library. Mr. Barrett also demonstrated the benzol test for hairiness in wool—a test evolved by the college—and showed the books used in studying the wool course.

The party was then taken to the wool room and a brief call was made to the engineering and carpentry workshops before visiting that part of the sheep farm where experimental work was being carried out.

A 25-acre paddock had been divided up into 1-acre plots, and by staggering these over the whole area a fair comparison could be obtained. Each group of 5 plots was given a different manurial treatment, and the breeding ewes which the different plots carried were watched carefully for signs of such diseases as facial eczema. The sheep are rotated round each plot in the group, being moved every day. Grazing is carefully controlled so as to keep the grass at its optimum growth.

This particular section of land was naturally browntop and rush land, but deep ploughing and thorough mole draining had transformed it into first-rate pasture land. It was observed that the college gets no more fertiliser than the average farmer, and that extensive use was made of pampas grass for near shelter. On the far side of this experimental plot was an area of the new H1 ryegrass. Many questions on pasture management and animal husbandry were answered before the party moved on.

A brief visit was then made to the poultry section, where Mr. Barrett explained the various methods used for egg recording, and the progress made in raising auto-sexing strains. In the incubator room members were initiated into the "mysteries" of sexing day-old chicks.

The party then visited the dairy factory, which supplies cheese starters for factories in all parts of the North Island, and which also supplies milk for the schools. From the factory, a visit was paid to the milking shed—a model of cleanliness—and the piggeries. Here several interesting points in animal breeding were brought up, and several misconceptions exploded.

At the silage section both stack and pit silage has been made, and a detailed account was given of its manufacture and what the best silage should be like. Apparently there is still a lot to be found out about this highly suitable means of conserving fodder.

Mr. Barrett hoped that the visit would be repeated at a later date, when the college would endeavour to make the tour a more specialised one. Visits from Young Farmers' Clubs were always welcome, because the farmers can help the research workers as much as the specialists help the farmers. Mr. M. M. Marshall thanked the college authorities, and in particular Messrs. Barrett and Rae, for devoting their time to the club.

—MALCOLM F. GRAY, Hon. Sec.,
Marton Y.F.C.

Country Life Interpreted to 700 Town Children

EDUCATIONAL work of a high order was carried out recently by three members of the Manawatu Young Farmers' Clubs, whose addresses on country life at a gathering of the 700 pupils of the Palmerston North Intermediate School constituted another step towards breaking down some of the prejudices and misunderstandings which exist between the people of town and country. The three Y.F.C. members were Messrs. A. V. Lithgow (hon. secretary, Wellington Council); MacGregor Donald (chairman, Manawatu District Committee); and Ivan Tabor (vice-chairman), who were deputed by the Wellington Council and the Manawatu District Committee to combine with Massey Agricultural College in the latter's arrangement of five 10-minute addresses to the children, interspersed with agricultural films showing the workaday life as it is on the farm of today. The other two speakers were Miss B. Hitchon (whose work as a Sarah Ann Rhodes Rural Scholarship holder, of Victoria University College, keeps her in close touch with country women's organisations in the Wellington provincial district), and Mr. L. A. G. Barrett, of Massey College.

Prefacing his remarks by pointing out the disastrous effects of misunderstandings and prejudices in the international field, Mr. Lithgow went on to describe the smaller "wars" which could, and occasionally did, break out among sections of any one nation or country. For one's own personal development it was necessary to understand the other person's mode of life and point of view, as it assisted one in learning more truly the relative value of his or her own environment and opinions. The artificial gulf between town and country in New Zealand had, happily, been bridged on outstanding occasions during the war, when townspeople had grouped together and enjoyed helping on the farms during seasonal periods of acute labour shortage. Much more of that helpful national spirit was to be desired.

Modern farming demanded skill of a high and varied order, said Mr. Tabor, and farming was for the bright boy of the family, and not for the dullard. Mechanisation had taken much of the drudgery out of farm work and life, which now opened up a wide field for those with mechanical leanings. The modern farmer required to be something of a mechanic,

The five speakers who addressed the 700 town children: Left to right—Messrs. MacGregor Donald (chairman, Manawatu Y.F.C. District Committee), L. A. G. Barrett (Massey College), Ivan Tabor (vice-chairman), Miss B. Hitchon (Victoria University College), and Mr. A. V. Lithgow (hon. secretary, Wellington Y.F.C. Council).

engineer, surveyor, carpenter, veterinarian, accountant, and lawyer, and still remain at heart a farmer skilled in animal husbandry and pasture management.

Mr. Donald dealt with the social side of rural life, with particular reference to the activities of Young Farmers' Clubs, whose field days and educational outings were becoming more and more the focal point of social life. Their wide scope of activity was steadily breaking down any feeling of isolation in the country districts.

The difference between town and country life might be described as the difference between an asphalt path and a grassy one, stated Miss Hitchon. Country life gave so much satisfaction that there was no necessity to look further afield for one's entertainment and recreation. The task of seeing that the home, the family, and the farm worked as one unit was of absorbing interest to the cheerful, resourceful women of the countryside.

The psychological effects of environment were dealt with by Mr. Barrett, who gave several illustrations of the countryman's refreshing point of view. Every opportunity should be taken of spending holidays in the country. Much of the pride and prejudice of the towns was as hard, cruel, and sterile as the asphalt from which it sprang.

Reports on Club Activities

WESTERN SOUTHLAND

Lochiel.—Y.F.C. Memorial and Land Settlement schemes, and Lincoln College Old Students' Association Scholarship discussed. A talk on "Farming in America" was given by Sgt. Lukins, of the U.S. Joint Purchasing Board.

Seaward Downs.—Annual inter-club debates and associate judges at the A. and P. show discussed. Lecture by Mr. J. P. Gavan, Department of Agriculture, on "Artificial Insemination."

EASTERN SOUTHLAND

Five Rivers.—Arrangements for a social and a debate, the subject of the debate to be "Has Science Benefited Mankind"?

SOUTH OTAGO

Milton.—Lecture on "Farms and Farming in Egypt" by Sgt. McCallum, a former member recently returned from overseas.

Warepa.—Discussion on entries for the sheep classes open to Y.F.C. members at the Clutha and Matai A. and P. Summer Show. Welcome extended to Flying Officer M. Miller, a member recently returned from overseas. In view of the electric power now being reticulated through the district it was decided to endeavour to secure an electrician to address the next meeting. Mr. Findlay gave an address on "The Federated Farmers."

DUNEDIN

Dunback.—Discussion on "bays" at Dunedin Winter Show. Dance to be held to raise funds.

Palmerston.—This club has been recently revived; it was one of the original clubs formed in Otago about 12 years ago. Officers elected for the current year: Advisory president, Mr. J. Clearwater; chairman, P. Ellis; secretary and treasurer, C. Nimmo. At the last meeting reported an address on "New Drugs for Farm Use; and the Diseases of Sheep and Cattle, their Cure or Prevention" was delivered by Mr. G. A. Thomson, B.V.Sc.

SOUTH OTAGO

Enfield.—Discussion on raising of funds for the club honours board. Arrangements for a dance. An impromptu speech competition raised an enthusiastic response, the subject being "The Best Way to Mother a Lamb."

Five Forks.—The club roll of honour was read out and examined by members. Secretary to write to hall committee for permission to erect honours board in the hall. Letter of thanks to Messrs. McCaw Bros., Hakataramea, thanking them for invitation to visit their property. Lecture on "Soil Fertility" by Mr. T. A. Sellwood, Department of Agriculture.

Herbert.—This club is at present holding fortnightly meetings. Since the initial meeting three months ago the membership has grown from 11 to 24. At two recent meetings the business included arrangements for a dance and a gala evening, and addresses were given by Messrs. A. M. McMillan and D. Christie on "Farm Finance" and "Poultry Farming" respectively.

SOUTH CANTERBURY

Geraldine D.H.S.—Decided to form a cricket team. A debate was held, the subject being "That Tractors are more Beneficial to Farmers than Horses." Speakers, M. Neutze, P. Sherratt, I. Guerin (affirmative), R. Scott, E. Green, T. Stevenson (negative).

MID-CANTERBURY

Hinds.—Decided to hold the prepared speech competition at the next meeting, Mr. R. Ross to be asked to act as judge. Two former members returned from overseas gave addresses on their experiences—M. Davidson as a prisoner of war, and R. Cocks on his trip to Sydney.

Methven.—Reports on the recent A. and P. Association meeting, and the district stock-judging competition held at Longbeach were given by C. J. Wilson and T. Callaghan respectively. Arrangements made for the Pasture Judging Competition. Mr. Todhunter gave a lecture on "The Problems of High Country Farming."

CHRISTCHURCH

Darfield.—Arrangements for stock-judging competition. Report and balance sheet of the annual ball; profit of £5 3s. 7d. to be donated to the R.S.A. Benevolent Fund. A debate was held with the Farmers' Union, the subject being "That Secondary Education would be Better in Our Own District than in Christchurch." Speakers for the Farmers' Union (affirmative), Messrs. H. Buttle, H. Bedford, and T. Stewart; for the club (negative), I. Duncan, A. Mulholland, and B. Jarman. Mr. P. D. O'Connell awarded the decision to the club team by five points.

Ellesmere.—Two new members enrolled. Arrangements for dance. Mr. C. Galbraith, manager of Massey Harris Ltd., addressed the meeting on "Farming Conditions in Canada" and also exhibited films entitled "The Part We Play."

NORTH CANTERBURY

Cheviot.—Three new members enrolled. Arrangements for field day. Lecture by Mr. E. G. Smith, Department of Agriculture, on "Crop Rotation."

Hawarden-Waikari.—Arrangements for members to attend field day at Lincoln College. An address on "The Care of Farm Implements" was given by Mr. R. G. Black.

Oxford.—Debate, the subject being "Would an Eight-hour Day be Beneficial to the Agricultural Worker"? Three speakers took part on each side, those supporting the negative being declared the winners.

Scargill-Omihi.—Decided to donate profits from ball to the Y.F.C. Memorial Fund. The chairman, H. N. Munro, extended a welcome to two members returned from overseas, Arthur Stone and Norman Mahon. A lengthy discussion took place on nassella tussock. Mr. T. A. Campbell, of the W.E.A., lectured and exhibited films on "Java," and dealt with the problem of the nationalist movement in the whole of that area.

MARLBOROUGH

Flaxbourne.—Presentation to be made to vice-chairman, who is leaving the district. Mr. H. Cooke, a local dairy farmer, gave a talk on "Herd Testing," and demonstrated by testing samples of milk brought by members.

NELSON

Dovedale.—Mr. D. Merry, Department of Agriculture, lectured and exhibited film-strips on "Soil Erosion."

Moutere.—Arranged that at next meeting each member either give a short talk or read an extract from a paper. Lecture on "Pigs" by Mr. McIntosh, Supervisor, Canterbury Pig Council.

Murchison.—Finalising of arrangements for farewell evening to I. and T. Ford, who are leaving the district.

WESTLAND

Kokatahi-Koiterangi.—Programme of further meetings discussed. Card evening to be held to raise funds. A discussion on "Stripping v. Non-stripping of Cows," the speakers being W. H. Amberger, A. C. Monk, C. E. Cron, and A. Little.

WAIRARAPA

Carterton.—Arrangements for visit to the Seed Testing Station and Plant Research Bureau at Palmerston North. Teams selected for debate with Masterton Club for the Buchanan Shield: Senior, N. A. Meek, R. McKenzie, V. Gates; junior, R. D. Bassett, F. O. Playle, J. F. Jones. Lecture by Mr. G. S. Robinson, Department of Agriculture, on "Certified Seed Production."

MANAWATU

Apiti.—Arrangements for shearing competition. Discussion to be held next meeting on possibility of the club holding an agricultural show. Address by Mr. B. J Jackson on "Angles of Modern Education."

Bunnythorpe.—Resignation of the club treasurer, J. Donald, regretfully received; Mr. Donald is taking up farming in the Waikato. Short addresses given by members as follows: S. Anderson ("Invercargill"); T. Slack ("Dunedin"); J. O'Donnell ("Penicillin"); J. O'Brien ("Paspalum").

Colyton.—Club recently revived. Twelve members enrolled at initial meeting. At a recent meeting a report was submitted on the District Committee meeting held at Palmerston North. Mr. J. Hill-Motion, veterinarian, addressed the club on "General Veterinary Work." The membership has increased recently to 20. A shearing day was held in Mr. Linklater's woolshed, Colyton, at which shearing demonstrations were given by Messrs. E. Dungey, C. Burr, and J. Humphreys, and Mr. J. Lind gave some useful hints on shearing.

Feilding.—Preparations for the Feilding Y.F.C. Agricultural Show, and arrangements for the club's annual dinner. Mr. A. A. Johnson, of Massey College, who was one of the party of N.Z. agricultural experts who visited Great Britain during the war, spoke on his experiences.

Halcombe.—Arrangements for a dance. Mr. A. C. Buist, of Feilding, gave an address on "How to Conduct a Meeting."

Kairanga.—Mr. L. L. Marsdon, Supervisor of the District Pig Council, gave a talk on "The Management of Pigs; Housing, Feeding and Breeding." The chairman reported on the recent District Committee meeting held at Palmerston North. Short talks by club members, one on "The Making of Gates" and the other on "The Harvesting of Hay." At a previous meeting suggestions were made for the raising of funds for the Y.F.C. Memorial; three club members gave short talks; and B. Kernohan, a club member, exhibited some interesting films on "Harvesting, Old and New."

Kimbolton-Kiwitea.—Report on recent District Meeting. Club debate, "Horses v. Tractors," all members present taking part.

Oroua Downs.—Arrangements for club's assistance at the Feilding Y.F.C. Show. Visit to be made to Longburn Freezing Works. Mr. T. W. G. Page, of the Hawke's Bay Herd Improvement Association, gave a lecture on "Sire Survey." At a previous meeting Mr. B. Brown gave a talk on Nauru Island and the manufacture of superphosphate in New Zealand.

Rangiotu.—Address by Mr. M. H. Oram, M.P., on "How to Conduct a Meeting."

Rongotea.—Visit to Messrs. Borthwick's freezing works arranged. Two new members enrolled. Mr. H. de O. Chamberlain, Department of Agriculture, gave a lecture on "Grass Seeds, their Purchase, Valuation, and Sowing."

Waituna West.—This club has recently resumed. Officers elected: Advisory president, Mr. N. V. Shannon; chairman, J. Small; secretary, B. H. Clare; treasurer, B. M. Younger. Nineteen members enrolled at the initial meeting. At the next meeting a report was submitted on the recent district meeting at Palmerston North, which was attended by delegates from the club, and the holding of a field day and sports meeting discussed. The meeting was addressed by Messrs. R. Meads and J. C. Old on "The Activities of the Y.F.C." and "Shearing and Judging, etc.," respectively.

Whakarongo.—Mr. R. Berry, an ex-prisoner of war, to be approached to give an address on his experiences. Mr. A. A. Johnson, of Massey College, recently returned from England, gave an address on "Agriculture in Great Britain."

WANGANUI

Marton.—Report on recent district meeting. Final for debating contest fixed. Presentation of district efficiency and senior stock-judging trophies. Further discussion on the Y.F.C. Memorial scheme. Address by Flt./Lt. H. C. Kimpton, who was secretary of the Marton Y.F.C. in 1939, and donated the trophy for the senior debating contest in the Wanganui district. He gave an account of conditions in England now and during the "blitz"; his flying experiences were as varied as they were interesting.

Waimarino.—Arrangements for lecturers at future meetings. Representatives selected to attend Ohakune Calf Club meeting. Delegates to the recent Wanganui District Committee meeting gave a report of the proceedings. Address by Mr. P. Tocker on "Various Things of Interest in the Middle East and Syria." At meetings previously unreported the Y.F.C. Memorial scheme was discussed and arrangements made for a dance. Mr. A. R. Dingwall, Department of Agriculture, spoke at one meeting, and Mr. Ashmore at another, both on casting worms. A field day was held on Mr. D. J. Berry's property, the owner giving a demonstration on the judging of Southdowns.

SOUTH TARANAKI

Pihama.—Newly-formed club. Officers elected: Advisory president, Mr. R. M. Cathie; chairman, Keith Julian; secretary, Roger Corkill. Twelve members enrolled at initial meeting.

CENTRAL TARANAKI

Bird Road.—Newly-formed club. Officers elected: Advisory president, Mr. R. Young; chairman, J. McDonald; secretary, M. J. O'Neill; treasurer, P. O'Neill.

Toko.—Seven new members enrolled. Supply of Departmental bulletins, etc., to be obtained. Lecture by Mr. Fearn, Sydney Veterinary College, on "Feeding for Production."

NORTH TARANAKI

Karawaka.—Discussion of programme of lecturers.

Mangamahoe.—Lantern lecture by Mr. A. C. Burgess, Department of Agriculture, on "Silage."

Mangorei.—Arranging programme for future meetings. Impromptu speeches on farm topics.

SOUTHERN HAWKE'S BAY

Ballance.—Letter received from Pte. Wilton, overseas member, thanking the club for parcel, and giving a description of Northern Italy. Mr. L. L. Marsdon, Supervisor, District Pig Council, addressed the meeting, and stressed the importance of turning all available skim-milk and whey into pig meats.

Mangatainoka.—Discussion on Y.F.C. classes at the Pahiatua A. and P. Show. Decided that insufficient time would be available on show day for stock-judging. Reports on District Committee and Wellington Council meetings. Arrangements for a dance, profits to go to the Y.F.C. Memorial fund. Mr. Bruce Forbes, a former member, addressed the meeting on his impressions on farming in the Middle East and Italy.

CENTRAL HAWKE'S BAY

Waipukurau.—Trustees appointed. Programme for future meetings discussed. Mr. N. Jamieson, chairman of the N.Z. Wool Board, gave an address on the wool situation and his trip to England.

NORTHERN HAWKE'S BAY

Wairoa.—The monthly meeting was preceded by a dinner at the Wairoa to welcome home members returned from overseas. Conditions and all arrangements for the fat lamb competition were finalised. Mr. B. Teague gave a lantern lecture of 100 slides on "Urawera Explorations."

POVERTY BAY

Gisborne.—A memorial trophy to be acquired for annual competition. Discussion on Y.F.C. Memorial scheme. Arrangements for a country dance. Mr. R. E. Alexander, Government veterinarian, gave an address on diagnosis of animal ailments and diseases.

TAUMARUNUI

Kaitieke.—Newly-formed club. Officers elected: Advisory president, Mr. L. K. Couper; chairman, J. Hare; secretary and treasurer, D. McFadyen.

Ohura.—This club has recently resumed. Officers elected: Advisory president, Mr. W. A. Tocker; chairman, C. W. McClure; secretary and treasurer, N. J. Dougherty. Six members enrolled at initial meeting. At a subsequent meeting membership increased to 10. Arrangements made for a field day, etc. Discussion on the proposed Agricultural High School in the South Auckland district.

Taumarunui.—Arrangements for future meetings. Delegate to attend meeting of Auckland Council. Discussion on ways of raising money for the Y.F.C. Memorial fund. Officers elected at earlier meeting: Advisory president, Mr. F. Duncan; chairman, R. J. Coates; secretary and treasurer, A. D. Kinnell.

WAIKATO

Cambridge.—Arrangements for field day at Mr. F. Discombe's piggeries at Hautapu. A welcome home to returned members to be held. Programme for future meetings discussed. Roll of honour board to be provided.

Hinuera.—Newly-formed club. Officers elected: Advisory president, Mr. W. Oates; chairman, P. Blyde; secretary, D. McPhail; treasurer, A. Newman.

Ngarua.—Cricket club formed. Arrangements for a judging competition. Lecture by Mr. T. E. Rodda, Department of Agriculture, on "Conserving Winter Feed."

Okoroire.—Two new members enrolled. Discussions on the Y.F.C. Land Settlement and Memorial schemes, and the Lincoln College Old Students' Association scholarship. Lecture by Mr. J. R. Murray, Department of Agriculture, on "Soils in New Zealand."

Springdale.—Newly-formed club. Addresses by Messrs. D. E. Waide and A. H. Coombe on "The Y.F.C. Constitution" and "How to Conduct Meetings" respectively. Twelve members enrolled at initial meeting.

Te Awamutu.—Welcome to a returned member, L. Clarke, who had been a prisoner of war in Germany. Address by Mr. Nielsen on "Problems Confronting the Dairy Industry" and "Sire Survey Work." A field day was held on Mr. Krippner's farm, Te Rore; demonstrations by Mr. Krippner as follows: Methods of utilising waste materials on farm; use of bricks instead of concrete in cowyard and gateways; topdressing pastures with skim-milk instead of rearing pigs.

Te Pahu.—Campaign for new members. Discussion on ways of starting the sports side of the club. Address by Mr. S. J. Sheaf, of the Auckland Herd Improvement Association, on "Sire Survey and Herd Improvement."

WESTERN BAY OF PLENTY

Te Puke.—Arrangements for field day on Mr. L. Ash's property, Te Matai Road. Lantern lecture by Mr. A. V. Allo, Department of Agriculture, on "Commercial Fertilisers."

Te Puna.—Lantern lecture by Mr. A. V. Allo, Department of Agriculture, on "Commercial Fertilisers."

Waihi.—This club has recently resumed. Officers elected: Advisory president, Mr. A. H. Blackmore; chairman, I. Blackmore; secretary, R. M. Cullen; treasurer, R. Gordon.

Welcome Bay.—Reports on dance and birthday social. Resignation of H. Bartz, vice-chairman, received with regret; G. Cooper elected to fill the vacancy. Stock-judging team selected to compete at Te Puke field day, comprising T. Mossop, O. H. Sorrensen, and T. Hockey. Two new members enrolled. Donation to be forwarded to the District Committee. Tentative arrangements for a shearing field day. Decided to hold a concert. Mr. J. C. Hammond (advisory president) gave a talk and demonstration on "How to Set up a Shearing Handpiece."

EASTERN BAY OF PLENTY

Opotiki.—Members of the Opotiki District High School Y.F.C. to be invited to attend all meetings and field days; a debate has been arranged between the two clubs. D. Bennett reported on the debate against Waimana Y.F.C., won by the latter club. Letters of thanks to be sent to Messrs. D. Sherson and F. Grant for training the Opotiki team. Challenge issued to Waimana Y.F.C. for a cricket match. Lantern lecture by Mr. E. R. Marryatt, Department of Agriculture, on "Feed Flavours."

Thornton.—Short speeches by 10 members as a preliminary to selecting a debating team for the inter-club competition. New members enrolled.

AUCKLAND

Clevedon.—Decided to allocate £3 to the regional planning committee. Final arrangements for a dance. Two members appointed as delegates to the Clevedon Calf Club group committee. General discussion on "Reconstruction on the Clevedon Area." At a previous meeting a team was selected to debate with the Farmers' Union. Addresses by Messrs. W. A. Clark and C. Clark, chairman and secretary respectively of the Primary Production Council, on "Regional Planning."

East Tamaki.—Report on barn dance; profit of £14 5s. 10d. Address by Mr. Gainor Jackson, Chamber of Commerce, on "Some Aspects of Post-war Trade."

Franklin.—Concert to be held at Papakura. Report on recent District Committee meeting. Field day to be held at Alton Lodge, Te Kauwhata. Farm-planning competition to be held. The chairman, R. Legg, had been selected by the District Committee to give a radio broadcast in the Y.F.C. session, 1YA; members agreed to leave the selection of the subject to the speaker. Address by Mr. N. Kirton on "The Application of Science to the Problems of Primary Production in New Zealand."

Harrisville.—Discussion on proposal to establish a new Agricultural High School in South Auckland. Report on recent field day at Messrs. Sanford Bros., Tuakau; a judging competition on pedigree Jersey cattle was won by W. A. Barnaby; impromptu speeches by members.

Pukekawa.—Field day and fat lamb competition arranged. Report on the club's visit to the dehydration factory at Pukekohe. Decided to buy a set of cricket gear. A "hard up" dance to be held. One new member enrolled. Mr. H. E. Clark, of the Auckland Pig Council, gave a lecture on "Pigs."

Pukekohe East.—Discussion on recent visit to Alton Lodge. Report on dance. Address by Mr. W. Marshall, B.A., Principal of Wesley College, Paerata, on "Public Speaking and Debating."

THE GOOD NEIGHBOUR

THOUGH the narrative of St. Luke gives us our most vivid picture of the nativity of Christ, it is to St. Matthew we are indebted for the story which contributed so much to the beauty and wonder of that first Christmas—the story of the wise men who came from afar to worship the Infant King. Having first seen the star in the east, they followed its shining light till it rested clear and bright above the lowly stable in the little Judean town called Bethlehem. There these men of learning, wealth, and power knelt in adoration before a new-born Child.

And when they had opened their treasures, they presented unto Him gifts; gold, frankincense and myrrh.

The humble shepherds who stood watching had probably never looked upon such rare and costly things before, yet their hearts were so filled with praise and thanksgiving at the coming of the Christ Child that there was no room for envy of those able to bestow such vast riches upon Him.

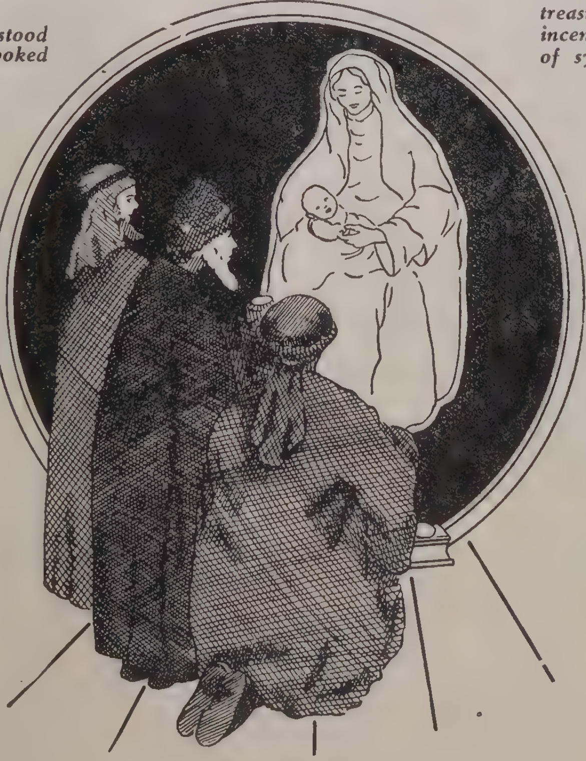
There was a Knight of Bethlehem

There was a knight of Bethlehem
Whose wealth was tears and sorrows;
His men-at-arms were little lambs,
His trumpeters were sparrows;
His castle was a wooden cross,
Whereon he hung so high;
His helmet was a crown of thorns,
Whose crest did touch the sky.

The graciousness of giving is the very essence of the Christmas tradition. Meagre as our material possessions may be, and limited our talents, we can still, if we so desire, offer a gift worthy of our Lord.

"What can I give Him, poor as I am?
If I were a shepherd, I would bring a lamb;
If I were a wise man, I would do my part;
Yet what I can I give Him—give my heart."

Love and reverence accompany that offering, together with all that is finest in our daily living—kindliness towards our fellow-men; compassion for the afflicted, the lonely, and the sorrowing; diligence in our undertakings; courage to meet the unexpected and unknown; healing laughter; joy in Nature's loveliness.



As the anniversary of Christ's birth approaches let us renew our homage in this Christmas prayer:

Our God, we who are poor and lôwly, come to worship Thee, the High, the Holy. In Christ, the Holy Child, Thou has become to us Immanuel, God for ever with us. We need not leave our homes to seek by starlight some far-off shrine, for the Babe is no longer Bethlehem's pride and Mary's joy, but the whole wide world's, and the blessed burden of all who give Him room.

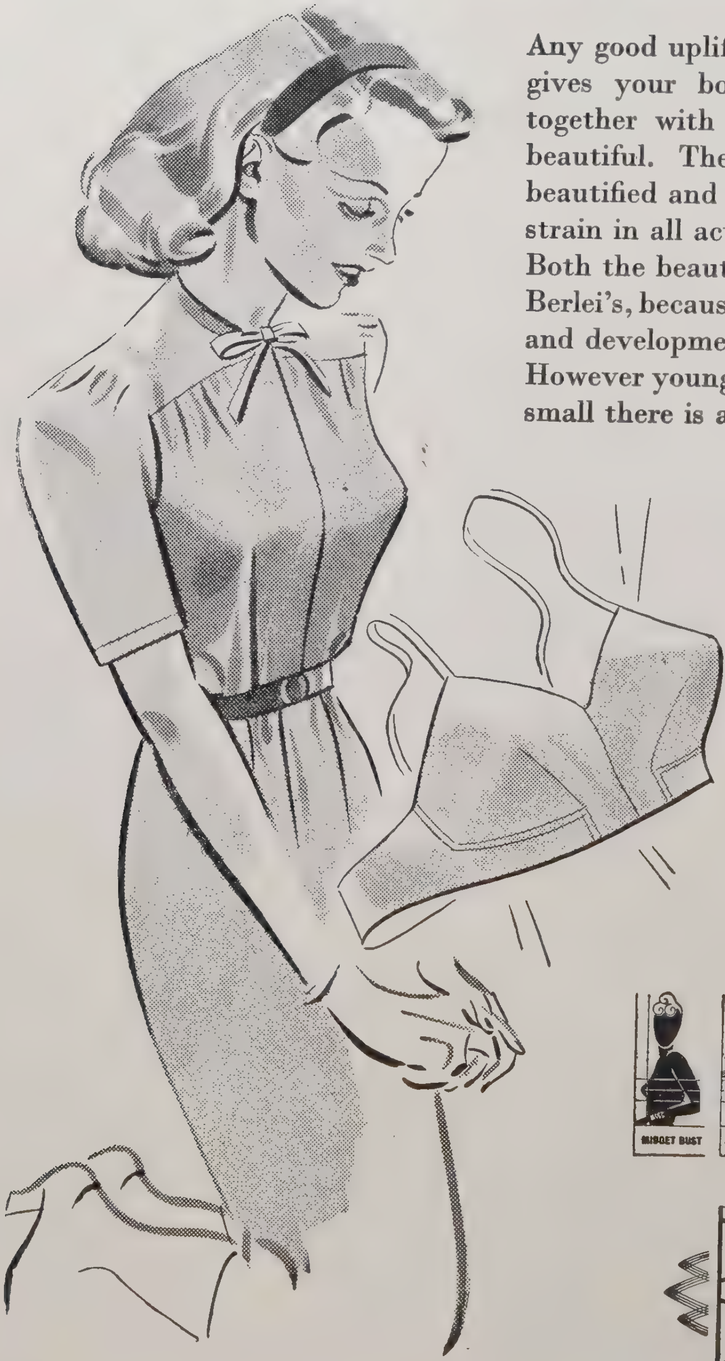
Here we dedicate our re-discovered treasures, gold of royal love, frankincense of holy intercession, myrrh of sympathy, and bear them forth to bless all birth, and to make at every cradle a carol of welcome and a solemn service of the Christ.

Mary

* * *

"... the Virgin blest
Hath laid her Babe to rest ....
Heaven's youngest-teemed star
Hath fixed her polished car,
Her sleeping Lord, with handmaid lamp, attending;
And all about the courtly stable
Bright-harnessed angels sit in order serviceable."
—Milton.

Berleified is more than beautified



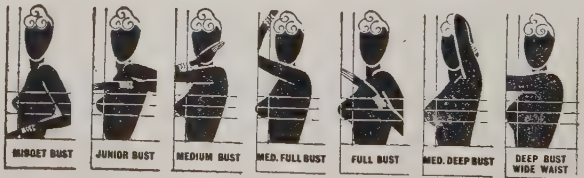
Any good uplift will beautify, but only a Berlei-bra gives your bosom the beauty nature intended, together with the protection it needs to remain beautiful. The bosom Berleified is the bosom both beautified and fortified—supported against sag and strain in all activities.

Both the beauty and the protection are peculiarly Berlei's, because a Berlei-bra is made for your shape and development as well as your size.

However young, however old, however big, however small there is a Berlei-bra exactly yours.

Yes, however small . . . You can't begin to care for those curves too young. Bosom beauty is a frail beauty, and needs all the help it can get if you'd have it for keeps. With the help of Berlei, you'll carry yours into the years with confidence and grace.

★ *Try it on before you buy it. Now there's little elastic, it has to fit exactly.*



Berlei-bra

Joy on Earth

By Roma M. Henden

Rod could see the quiet figure by the gate from half-way down the second hill. As his cycle rapidly approached, the woman became no longer a distant unknown quantity, but an individual, with softly-lined face, bright brown eyes, and greying hair caught into a low knob at the nape of her neck.

"Good morning, Rodney," said Mary Murphy, as he stopped at her gate. "Have you any mail for me?" She tried to hide the eagerness in her voice, but her hand trembled slightly as she put it forth to take the letters he held out to her.

"Yes, quite a bundle this morning, Mrs. Murphy; most likely to say all the youngsters will be home for Christmas. What a houseful you are going to have."

"Oh! I hope so," said the woman fervently. Already she was feverishly tearing open the first envelope.

Rod, seeing her face as he passed on his return journey a few moments later, found all the brightness gone from it, and cursed angrily under his breath.

"I bet not one of them will be home," he muttered to himself; "too smart for their poor old mum now. I always said that all that there education 'd spoil 'em. Ashamed of her now, no doubt. Fine thing after all she's done for them. Talk about biting the hand that feeds you!" With which rumination he went about his business, telling the world what he would do if his Tom or Mabel turned out that way. Kids needed a man's hand in their upbringing, and if his hand had been just in the upbringing of his own children, it had also been undeniably firm.

Mary re-read the letters again slowly, trying in her heart to make excuses for her children—for children too wrapped up in their own affairs to spend a little of Christmas with her. The four letters were couched in different terms, but they meant the same thing. Elva and her husband were spending Christmas with friends in the city—wealthy, influential friends whom they could not afford to offend. "As if," thought Mary, "a real friend would be offended if Elva thought fit to spend Christmas Day at least with her own mother." Eileen was in the Services and would be staying with her young man of the moment at his home in the city. Mary was rather tired of hearing about Eileen and her young man. She had long ago realised the uselessness of trying to run Eileen's life for her. John and his wife and children were away touring somewhere, and Mandy, dear, lastborn Mandy, had "things to do, and simply could not get down." So that was that. Mary felt the prick of tears at the back of her eyes. Not that she had any desire to run her children's lives; it was just that they did not need her any more. She was a back-number, a forgotten and intolerably lonely woman, and at a time when there was supposed to be "joy on earth." Mary wondered sadly if all mothers were treated this way when their children grew up. She felt vaguely that something should be done about it. But what? "Why—I am almost back where I started," she thought tearfully.

Christmas Miniature

I see a great white space and in the
middle of it, Christmas,
A shrine of coloured candles on the
King's Highway;
And He who sits in state is our own
quiet Jesus,
And she who lights the tallow-wicks, May.
For Mary hath her roses and bluebells
in December,
All dewy is her gown with the spring.
I see it so plain in the Yuletide ember,
Round her the merry birds sing:
One of them has feathers like a little
yellow hammer,
One of them is azure as the day.
And a green thrush hops on a white
woolly lamb:
While round them the angels play
On sackbut and psaltery and castanets,
On tibia and tambourine and lyre.
And seven little alabaster minarets
See I, too, in the forest of the fire.

—Herbert Palmer.

(Sent in by "Tinkle Tinkle").

Slowly, as she walked up the path, wild notions came to her, such as ringing up the Orphanage and asking them to allow twelve of their most deserving children to come to Christmas dinner at "The Villa"; or going off on her own to some hotel or even going to the church festival—anything so long as she was not alone. Mary loved her home, although it seemed so empty now. With the spell of the past upon her, she wandered from room to room and finally settled herself in the sun upon the porch. This was her favourite retreat, and here she spent many hours. Her eyes never grew tired of looking out over the folds of green hills, gold laced with gorse, and dotted with sheep. Here and there great pines brushed their furry pates against the sky, while cattle grazed within their shade. Men had made little mark as yet upon these eastern hills, and Mary was glad, for she loved these wide green spaces and dreaded the day when they would be scattered with ugly little houses, and clothes lines with their flapping burdens.

Near at hand the flowering red currants were in bloom, and their pungent, heady perfume brought such vivid thoughts of youth and other days that she bowed her head and let the tears come freely. Strange how the scent of flowers, or the sight of a river, or a bend in a road will bring back the half-wistful memories of youth. Memories flowed thick and fast and Mary let them come. She let them flow over her mind as though some enchanted hand had swept away all thought of the present and future, and left only the past; all the great dreams and little deeds that had been hers.

Long ago in a garden when the flowering currants were in bloom a young man had asked her to become his wife. And a week later in that same garden he had said goodbye before he went gaily off to war. Yes, Trevor had gone away to fight just as the young men were going away to fight now, and she had never seen him again. Only she knew of the loneliness and heartbreak of those weary months and years of waiting for news that never came.

Then, when there seemed nothing more to hope for, and long after the war had drawn to its close, she had married Peter. She never loved Peter, but they had been grand companions and he had made her happy enough. So she buried Trevor respectfully in the depths of her heart, and cheerfully and dutifully bore Peter's children.

Mary was a good wife and mother, and nursed Peter faithfully through his fatal illness. She mourned him honestly, but there was little time for sorrow, for she was on her own now and had to rear her four children. Babyhood and childhood passed too swiftly; too swiftly they became young men and women, no longer needing her care and scornful of her guidance. Well—she had done her best. Hers had not been a spectacular life, yet she had done her duty and her best, and no woman can do more. The tears had long since dried, but her eyes, heavy with their yesterdays, still stared out over the hills.

The doorbell must have been ringing for some time before she heard, for it broke with its harsh summons through her reverie, startling her into sudden movement. It was not often she had visitors, especially at this hour of the day.

Mary opened the door timidly and faced a good-looking young man in uniform, who saluted her with a smile. Mary turned a little pale as she saw his face, and the young man started forward in alarm.

"Are you all right?" he asked, gently taking her arm.

"Oh! yes — quite — quite all right; just for the moment you reminded me of someone I knew many years ago when I was young," answered Mary, smiling faintly.

"Well, it wasn't me," and he suddenly coloured slightly as though he felt she might take offence. But Mary just stood quietly, an enquiring lift to her eyebrows. The young man realised suddenly that she was waiting for him to speak; he consulted a paper in his hand. "Mrs. Murphy, the Captain has sent me round to enquire whether some of the folks hereabouts would be willing to entertain our boys over Christmas. Owing to the cancellation of all leave the men are missing their Christmas at home, but they would be allowed to visit homes within 5 miles of the camp. There are 50 of us stationed here, and the Captain thought that if a few homes would each take two or three of the boys it would be more fun than staying in camp."

Mary's heart had already warmed towards this boy who was so like the Trevor of long ago, so she smiled sweetly as she said, "Well, son, if you can put up with an old woman's company, it would give me a great deal of pleasure to have three of the boys here for Christmas Day. Mind you, there are no young folk here—my children could not get home for Christmas—but I can promise you a good dinner and a sing-song." Her eyes twinkled, and the boy, who had lost his own mother many years before, felt an almost uncontrollable urge to put his young arms round her and kiss her soft cheek.

"Thank you very much." He turned to go, then looked back shyly. "My two cobbers and I will be very happy to come."

Mary's heart was joyful as she closed the door. It was going to be a Merry Christmas after all. She must see about getting suitable stores

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Issued for the Food and Rationing Controller by the Economic Information Service

EIS.MB2

right away. Those boys should have a Christmas to remember.

Mary made her weekly visit to the city. It was fun ordering things and she let herself go—she, too, was going to get some fun out of this. She even bought three little gifts and some tinsel paper and, deciding she could not carry another thing, made for the train and home. She did not care that she was missing the brightness of Christmas Eve in town; she bustled about putting up decorations and peeping at the mince pies in the oven. She dusted the piano and sorted out music, her own old pieces and piles of Eileen's latest ones. She even brought out the gramophone and Eileen's Boogey-Woogey records, much as she hated them. It was nearly 12 before she got to bed.

"Anyone would think I was a young girl waiting for her sweetheart," Mary told herself severely next morning, "I'm all atwitter." She looked at herself in the long glass. "I really don't look 54," she thought as she patted her neat head; she had even curled her hair the night before. Everything was in readiness, the chickens and the pudding were sending forth an aroma that would win the heart of any young man. Mary sat in the front room, so that she could see the boys coming down the road, and aimlessly turned the pages of an old album she had found among the piles of music the night before. She chuckled at some of the old dresses, then her hand paused in the act of turning a page. "He is the image of Trevor," she said, gazing down at a photo of herself taken with Trevor over 30 years before. "I wonder what his name is!"

Just then she heard voices. Her guests were coming up the path. Putting the album hastily on the bookcase, Mary fled to the kitchen, from which she shortly emerged with suitable decorum to answer the doorbell. She liked the three young men; they were open of countenance and wholesome as young men should be. All her shyness fled and, as for her guests, they promptly took charge of the house, called her Aunt Mary, invaded the kitchen, and bore the fruits of her labour into the dining room. They told her funny stories and listened joyfully to her own. It was fun; for the first time for years she was treated as an equal and no longer felt a nonentity and a half-wit as she did in the company of her children. After dinner they insisted that she sit in a chair and oversee the washing up, and, that duty done, they all retired to the sitting-room.

Although it was summer, the day was wet and rather cold, so a great fire was lit, and all the afternoon they sat about the fire talking, laughing, and playing cards. Mary was thankful that the children had insisted that she learn to play cards, and their teaching stood her in good stead. After tea they all gathered around the piano and sang for several hours. It was while Mary was preparing supper that Andy, the young man who had first come to her door, came quietly into the kitchen and said, "Aunt Mary, here is a strange thing. I have just seen my father's photo in your album. You know, your face did seem sort of familiar. I felt I had seen it before, and sure enough this is the same snap as dad has in his collection at home."

Mary, trembling, looked over his shoulder at the snap she herself had been looking at just before the boys' arrival. "I knew you were the image of Trevor," she said; "I knew when I first saw you."

"You knew my father well, didn't you?"

"We were engaged to be married, and then he went away to the war and I never saw him again. I thought he must have been killed." Mary measured the tea into the pot. "After many years I married; I had quite given him up."

Andy put his two hands on her shoulder. "I know the whole story, you know; father told me after the accident, that was when his memory came back."

Mary looked startled. "Accident? Memory? Please tell me; I don't understand."

"Yes, father had a head injury during the last war which caused loss of memory. His identity could not be established for some reason, so for years he lived under another name, not knowing who he was. He met and married mother, knowing nothing of his past life, and then I was born. Mother died when I was about 10. Some years ago dad had an accident and regained his memory. He was thunderstruck to know that he had been living a new life, that he had been married, and that I was his son. He showed me your photo and told me that that was the girl he was to have married. He spent a great deal of time trying to find you, until he learned that you had married. He never married again."

Mary was standing quite still. Her feelings were chaotic—what was this going to mean to her—this return of her old sweetheart? Truly, she had not thought of remarrying; she had never had the chance with her children to bring up, but now she was so much alone. She wondered what Trevor was like now. This boy brought such poignant memories, she could scarcely see for tears.

"Life is strange," she said at last calmly, "that it should bring you of all people to my door. Perhaps we shall meet again, your father and I. I wonder what he is like."

"You bet you'll meet again if I have anything to do with it. Besides, if you were as sweet then as you are now, I don't blame the old man for being in love with you."

"Go along with you, you dreadful boy." Mary had regained her composure. She laughed at him. The other two boys came noisily into the kitchen. "Now then, Aunt Mary," they cried, "don't let that Andy talk you into giving him our share of those mince pies." Laughing they all went back to the fire.

After they had gone, and Mary had finally crept into bed, she lay for a long time staring into the darkness. Surely such things did not happen in real life! She felt she had cast away for ever her old identity. No longer was she a has-been. Who knew what promise the tomorrows held. Perhaps she would no longer be alone.

The perfume of the flowering red currant seemed to invade the room. Mary smiled into the night. It had been a wonderful Christmas. She was still smiling as she fell asleep.

Never a Christmas morning,
Never the old year ends,
But someone thinks of someone,
Old days, old times, old friends.

ART BOOKS

AMBROSE KANGAROO—A Story that Never Ends, by Elizabeth Macintyre, 4/8 posted. This delightful picture book for very young children is notable for the freshness of its colour illustrations, its humour and its interest.

THE BOOK OF WIRIMU, by Stella Morice, 7/8 posted. This story of the life of a small Maori boy is likely to become a New Zealand classic. Beautifully produced, with superb illustrations by Nancy Bolton.

NOW WE ARE SIX, by A. A. Milne, 7/8 posted. A. A. Milne's amusing verses please children of all ages.

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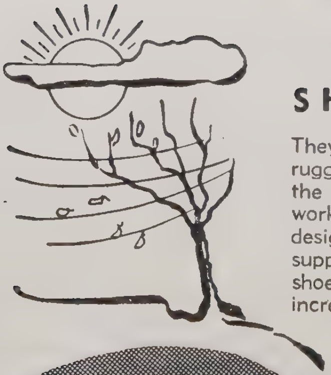

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Christmas Presents

DOLLS and dogs; books and bicycles; toys and timepieces and trinkets—these are some of the items listed by "Good "Neighbours" as being among the Christmas gifts which have afforded them the greatest joy. A noticeable feature of the competition was the high value mothers set on the little, inexpensive presents given them by their children.

First prize to "Alison Grey," Tauranga, and second prize to "Cloudy," Ashburton. Commended: "M," Feilding, and "Joan-of-all-trades," Putaruru.

First Prize

CHRISTMAS presents! What a host of memories that phrase stirs. Looking back over the years we recapture the same spirit of eagerness and excitement which we first experienced when we were very young and used to sit up in bed and feel the different shapes of our presents through the thin material of a pillowcase. My earliest recollection is of waking up on such an occasion and finding an orange-coloured teddy bear peering at me with glassy-black eyes. His arms were stretched appealingly towards me, the rest of his body hidden in the long white pillowcase which formed a skirt about him. I loved him then, and he won more affection than all my doll family put together. He is old now: his glassy eyes have been replaced by ones of black wool, his silky pile has worn off, and his hands have little darns in them to prevent the padding from falling out, but he has one redeeming feature—he still squeaks when pressed in the middle. Dozens of small children have played with him and he has often given comfort to a crying child.

The next gift which I particularly cherished was a miniature cash box complete with lock and tiny key, and inside was a shining new sixpence. I have never been able to accumulate much wealth, but there is something solid about my little box which suggests it will never outlive its usefulness.

In more recent years I became the proud owner of a camera. Through its tiny shutter I have captured many lasting impressions, which, during the long war years, have been constant company for me. With the return of films I hope again to record jolly gatherings and the laughing faces of little children with my camera.

Christmas, 1941, I received a parcel in the post bearing a Malayan stamp. I opened it in great expectation, nor was I disappointed, for nestling in a box among layers of tissue paper was a little silver brooch. Upon examining it more closely I discovered it was fashioned from tiny silver threads which formed an intricate filigree pattern. In the centre was a black stone. Singapore fell a few weeks later, and though we grew anxious through the long silence, I regarded the little brooch as a talisman. There was comfort in the fact that each twist and turn of the thin threads led to the central stone.—**"Alison Grey," Tauranga.**

Second Prize

"AND when the Princess awoke on Christmas morning it was to find a beautiful green riding habit and a silver whip by her bedside, while outside her window stood a snow-white palfrey caparisoned in crimson and blue, and on its hoofs were tiny golden shoes studded with diamonds. . . . " Such were the gifts of a Princess in the much-loved fairy stories of our childhood. Now on Christmas morning at the beginning of this century a tiny girl with the name of a princess, but no other claim to high degree, awoke in her cottage home to find a doll by the bedside. She could hardly believe that this waxen beauty, clad in white and silver, was hers. for gifts were rare in that home. No snow-white steed could have brought her as much joy as that doll.

As a schoolgirl some years later she received a Christmas parcel tied with crimson ribbon. A thoughtful cousin had chosen the one thing she so greatly desired and given her an autograph book with padded covers of moss-green suede.

Time passed on and there came the happy occasion of her first Christmas as a bride. Her husband presented his gift—a set of blue jugs, more precious to the home-maker than the rarest of gems.

And now comes a more recent Christmas, heralded by the eager chatter of two small girls anxious to present the first gifts they bought by themselves with their own carefully-saved pocket-money. Elder daughter gravely hands over a gay calendar and a large bundle of drinking straws, and younger daughter joyously comes forward with her package, quite certain that the baby's brush, comb, and mirror set which the box contains is for adult use. I envy no princess her possessions, for mine is the pageantry of memories of simple gifts emblazoned with love.—**"Cloudy," Ashburton.**

Commended

THE first and never-to-be-forgotten gift which filled my heart with pride and joy—and my playmates with envy—was a railway lever watch. It kept excellent time and was given me when I was five because I had learned to tell the time. My cup of joy brimmed over many times when the ancient school clock was corrected by this wonderful timepiece.

Next was a box camera and developing outfit which was a source of pleasure to us all, and many are the snaps we have taken which tell the story of our family through the years.

Later came the fountain pen which I was given when I was at high school. It is still in use because of the loving care it has always received. Lastly, I would choose the Children's Encyclopedia which is as eagerly read today as it was on that Christmas morning when I first opened those pages with their treasure trove of knowledge.—**"Joan-of-all-trades," Putaruru.**

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Commended

THERE have been so many Christmases, each with its own excitements and thrills, that it is hard to pick out only four outstanding gifts. However, I will start off with a wooden horse and cart on wheels—a fine present, this, and beloved for many years, only being discarded when age caused it to fall to pieces. Another childhood joy was a top—a glorious tin top of many colours and it hummed as it whirled round. My beautiful top! A jealous brother ruined it in a fit of temper.

My third choice was a pair of tall brass candlesticks, complete with orange candles, standing before a mirror which doubled their beauty. Lastly, I remember the proud day when I received a gold wristlet watch. My first watch had been obtained by saving tea coupons, and had done well enough for school, but this little beauty resting on black velvet still gives me as much pleasure as on that Christmas morning when I first opened the case. —**"M," Feilding.**

PERSONAL presents are always appreciated, and looking back over past Christmases I think hand-made gifts are most valued. I remember an exquisite petit-point comb case which gave me a tremendous thrill. It had been worked by a young girl who had very little leisure. She ran a home and a garden and cared for a semi-invalid mother, besides going to an office every day. Another treasured possession is a handkerchief sachet, made by a small niece. It might appear clumsy, but I love every stitch of the fat flowers adorning it and think of the earnest care with which she printed the accompanying card.—**"Sara E.," Otago.**

Competitions

JANUARY

January 15 is the final day for deciding which is your favourite flower—and why.

FEBRUARY

The Photographic Contest proved so popular last year that I have decided to hold another one. You may send in any number of entries and there are no restrictions as to the choice of subject. Descriptive matter accompanying each snap must not exceed 100 words. Send negatives as well as prints if possible, also a stamped addressed envelope for their return. The closing date is February 15.

"PHOTOGRAPHIC CONTEST"

The first prize is 10/-, and the second prize is 5/-, and 2/6 will be paid for each photo retained for future use, such photos to become the property of the "Journal."

"MARY,"
"Journal of Agriculture,"
Box 3004, Wellington.

THE first exciting Christmas present I remember was a lovely old blue china dolls' teaset. The rector's daughter gave it to me when I was three. The next present was from my godmother — a small Christmas tree decorated with candles and ornaments and bearing a gift for each member of our household. It gave us great joy. In 1896 my father gave me a bicycle when "safeties" were quite new. I shared it with my sister and it took us to many places. Another treasured possession was a friend's gift of an amethyst set with pearls. How I had longed for such a brooch.—**"Hannah," Hastings.**

MY little son, eager and excited, stands before me while I unwrap his first present to me—a small home-made box (not too secure even with all those tacks!). It contains four reels of cotton neatly laid on a strip of velvet. "Is it useful? Do you like it, Mummie"? he asks anxiously, and as I assure him I know that he has learnt, earlier than I did by far, that it is more blessed to give than to receive.—**"Eleanor," Whatitiri.**

THE desire of my life at 14 was for a fox-terrier puppy. I thought that no present could be so lovely. At 17 I was given a piano, something which I had never dreamed of possessing. A few years later we went to live in the country on a big sheep farm. The roads round about were very poor and the surrounding country hilly, so that cycling was almost impossible. Imagine my joy on Christmas Day when I was taken to the stables "to see the improvements the carpenters had made," and was presented with a beautiful bay mare which I was to call my own.—**"Carrots," Hauraki Plains.**

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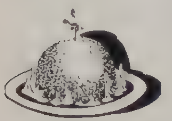
XMAS CHEER

If you are wondering how to achieve the usual array of Christmas dainties in spite of the butter and sugar rationing, here are some ideas which will assist you in overcoming the problem.

Equal parts of lard and butter are excellent in biscuits and cakes, and the inclusion of beef dripping in baking can be successfully disguised by using only 4/5 as much dripping as you would butter, and creaming it with a little lemon juice and a pinch of baking soda. Substitute grated suet for butter in your Christmas pudding (a jellied plum pudding is also a pleasant innovation), and you can omit 1½ to 2oz. butter from your Christmas fruit cake if you add an extra egg. The addition of an egg to cheese busters reduces the fat ratio to 1oz. butter to 6oz. flour. When preparing a savoury egg filling for sandwiches or pastry cases, moisten the mixture with a little milk instead of melted butter. A tablespoon of milk blended with each tablespoon of butter will make the butter go further for spreading on bread or biscuits. Tasty cheese savouries can be made without butter—dip fingers of bread first in beaten egg and milk, then in grated cheese, and bake in a moderate oven for 20 minutes. Mincemeat rolls are a change from the traditional mince pies and also have the advantage of being butterless.



Golden syrup helps to sweeten buns and cookies, and so if used it is not necessary to keep to the full amount of sugar stated in the recipe. You can economise on icing sugar by frosting sponges or plain cakes by beating ½ cup jelly (quince, red currant, blackberry, or whatever flavour you like) with a dash of salt and the white of an egg till the mixture is stiff enough to hold its shape.

JELLIED PLUM PUDDING

1½ pints milk, 3 tablespoons cocoa, pinch of salt, 1 cup sugar, 1 cup raisins or sultanas, ½ cup currants, ½ cup dates, 1 cup chopped nuts, lemon peel, ½ teaspoon vanilla essence, 3 dessertspoons gelatine.

Dissolve the gelatine in a little hot water. Blend the cocoa, salt, vanilla, and sugar with sufficient cold milk to make a smooth paste. Bring the rest of the milk to the boil and stir in the cocoa mixture. Stir in the gelatine, chopped lemon peel and walnuts and fruit, and cook for 5 minutes. Pour into a mould to set. When ready to serve, turn on to a dish, put a sprig of holly on top, and serve with custard or mock cream.

HAM MOUSSE

1 egg, 2 cups minced ham, 2 tablespoons minced onion, 1 tablespoon grated carrot, 2 tablespoons cooked peas, 1 teaspoon vinegar, 1 tablespoon gelatine, 1 teaspoon salt, ½ pint vegetable stock, ½ pint milk.

Dissolve the gelatine in a little hot water. Beat the egg and add the salt, vegetable stock (or water flavoured with meat extract) and milk, and stir over boiling water till the mixture thickens. Remove from fire and mix in the gelatine, then the minced ham (minced tongue also makes a nice addition to the mousse), vegetables, and 1 teaspoon vinegar. Turn into a ring mould, or leave in individual moulds to set. Serve with salad.

MINT SAVOURY

1lb. seeded raisins, full cup of mint leaves.

Mince together, then add small cup of very hot vinegar. Mix all well together, and leave for a few days before using. For sandwiches, or spread on mincemeat, and put between pastry and cooked it is delicious.—**Elizabeth Bond, Canterbury.**

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STRAWBERRY MOCK CREAM

1 pint milk, 2 tablespoons cornflour, 1 cup sugar, 1 dessertspoon butter, white of 1 egg, ½lb. strawberries.

Bring the milk to the boil and thicken with the cornflour which has been blended with a little cold milk. Boil 3 minutes, then cool. Cream the sugar and butter, add the cold cornflour, and beat well. Add the crushed strawberries, beat again and fold in the beaten white of egg. The more this is beaten the creamier it becomes. Garnish with a few ripe strawberries.

STAR BISCUITS

4oz. sugar, ¼ cup milk, ½ teaspoon baking soda, 3oz. butter, 1½ cups flour, pinch salt, ½ cup coconut, vanilla essence.

Rub the butter into the sifted flour, add the salt, vanilla, and coconut, and finally the soda dissolved in the milk which has been warmed. Roll out flat on a floured board and cut into star shapes. (Reserve a little of the mixture to make into biscuit "robins"—these can be made more realistic by icing with chocolate frosting, and using cochineal-tinted icing for the red breast feathers. The robin biscuits are most effective with the snow pudding in the next recipe). Bake in a moderate oven 15 minutes. Decorate the "stars" with lemon icing, or use plain white icing and sprinkle with lemon-coloured jelly crystals.

ROBINS IN SNOW.

2 dessertspoons gelatine, 2 egg whites, ½-cup sugar, pinch salt, ½-pint boiling water, 1 cup fruit juice, robin biscuits.

Dissolve the gelatine in hot water, then add the sugar, salt, and fruit juice. Leave to cool and when the mixture begins to thicken add the beaten egg-whites and continue beating till the mixture holds its shape. Put into individual moulds to set and when firm stand a robin biscuit in the centre of each dish of snow.

MINCEMEAT ROLLS

2 cups flour, 1 cup mashed potatoes, milk to mix, pinch salt, 3 teaspoons sugar, mincemeat.

Sift the flour, add the sugar and salt, and well-mashed potatoes, and mix to a stiff dough with milk. Shape into rolls. Bake in a quick oven. Leave to cool and then split them in halves and fill with sweet mincemeat.

PARTY PATTIES.

1lb. liver, ½-cup chopped onion, 1½ teaspoons salt, pepper, ¾-cup breadcrumbs, 1 egg, 2 rashers bacon, fat for frying, toast, parsley.

Place the liver in hot water for 10 minutes. Then grind coarsely with the bacon and mix with the seasoning, onion, breadcrumbs, and egg. Shape into small patties on a floured board and fry till golden brown (about 6 minutes for each side). Serve hot on rounds of toast and sprinkle with chopped parsley.

YULE LOGS.

5oz. sugar, 4oz. flour, 3 eggs, pinch of salt, 1 teaspoon baking powder. Beat the eggs and sugar well together and add the sifted dry ingredients. Turn into a sponge roll tin and cook for ¼-hour. To roll the sponge:—Dip half a tea towel in warm water; wring it out tightly, then fold the towel, placing the wet layer underneath and the dry part on top. Turn the cooked sponge on to this. Cut off side edges. Immediately roll up, using the towel to assist. Unroll, spread with warm jam, and roll up again.

To Make Into Yule Logs:—Mix together 1 dessertspoon flour and 5½ dessertspoons cocoa with a small quantity of milk. Heat 1 cup milk, stir in the flour and cocoa, and bring to the boil, keeping well stirred. Boil gently for a few minutes and then add 2 dessertspoons sugar and 2oz. butter, the latter cut into small pieces and stirred in a piece at a time until dissolved. Flavour with vanilla and leave till cold. The consistency of the chocolate cream should be stiff enough to hold its shape when piped. Put the cream into an icing pump or bag with a ribbon-patterned tube affixed and force it along the sponge roll, making a slightly irregular pattern. Either leave the roll as one large log or else cut into individual logs and smooth over the top of each piece with some of the chocolate cream. Decorate with holly.

HORSE-SHOES.

3oz. flour, 5oz. wholemeal, 1 dessertspoon cocoa, 3oz. sugar, vanilla essence, 2oz butter, 2oz. lard.

Cream the butter, lard, and sugar, then add the dry ingredients. Pat out flat and shape into horse-shoes. (A pattern of a horse-shoe should first be made from cardboard, then laid on the shortbread and the biscuit shape cut with a sharp knife). Bake in a slow oven ½ hour. When cool ice with chocolate frosting and stud with "nails" of chopped nuts.

WENCESLAS COOKIES.

2 cups flour, 1 teaspoon baking powder, pinch salt, ¾-cup sugar, 1 egg, ½-cup butter, 1 tablespoon golden syrup, 1 teaspoon cinnamon, 1 cup chopped raisins, and walnuts.

Cream the butter and sugar, add the egg, and then the dry ingredients. Beat well for 1 minute, then place in patty pans and bake in a moderate oven for 20 minutes.

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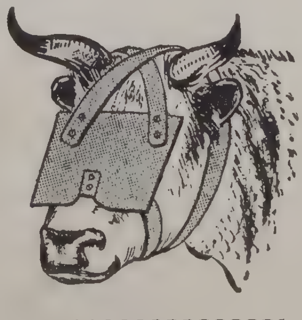

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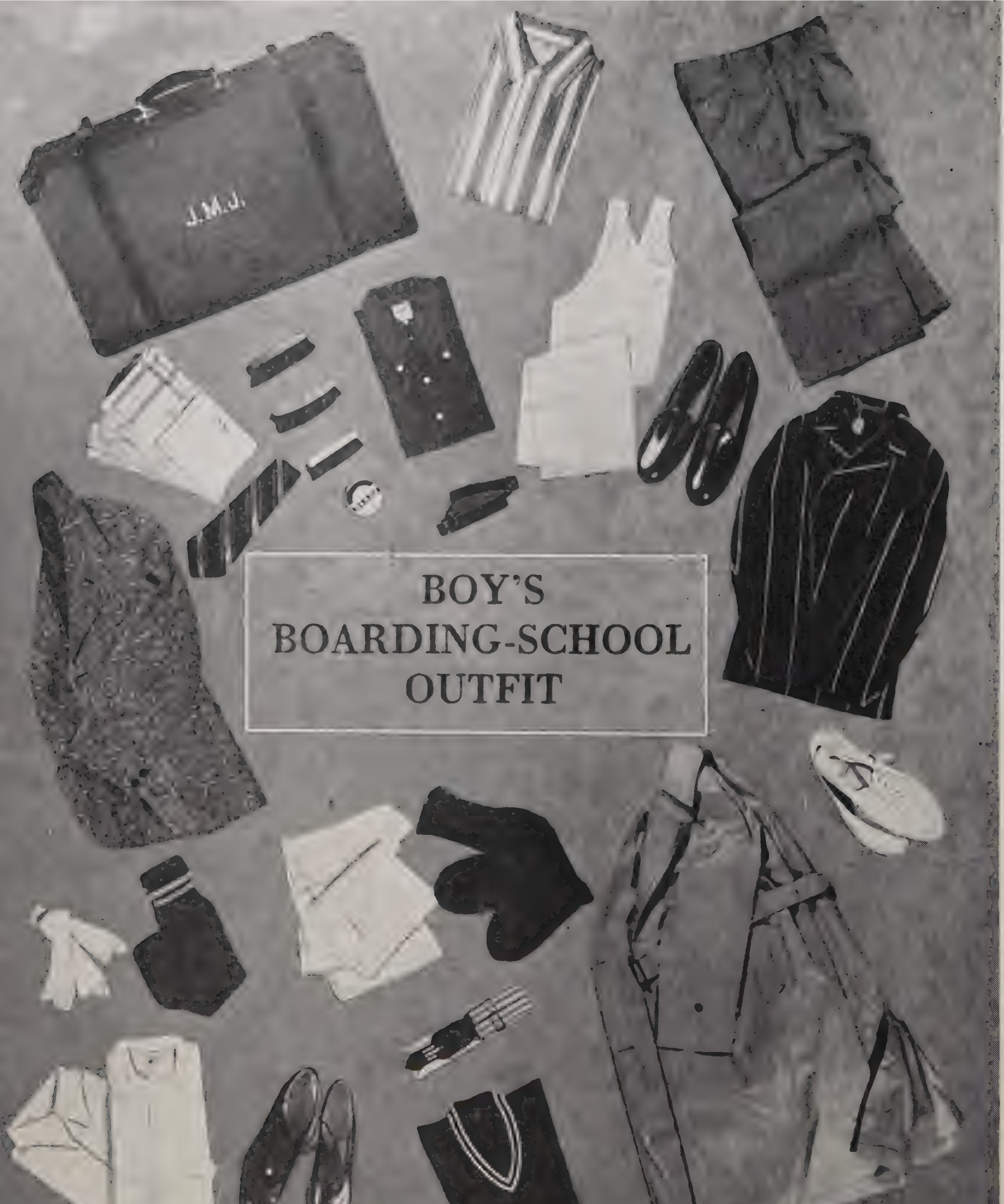
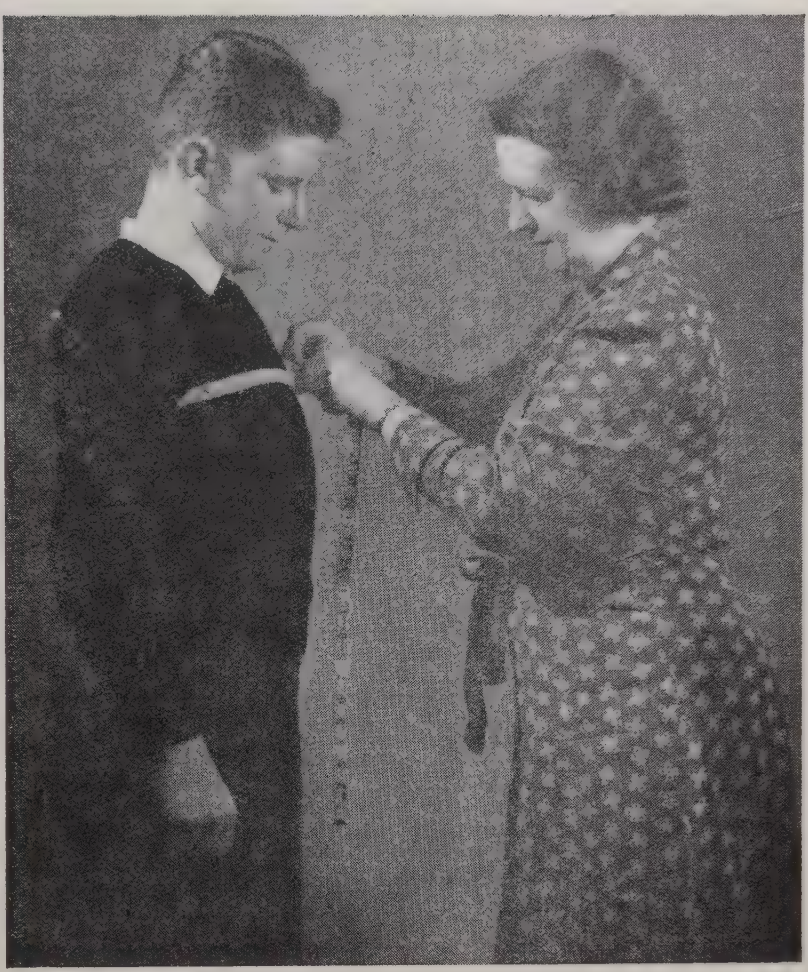


BOY'S BOARDING-SCHOOL OUTFIT

AT the beginning of every year numbers of country boys are on the point of starting their secondary education. Some may go into the townships daily to the district high schools, others have to stay away through the week, returning home from Friday afternoon until Monday morning, and some go further afield to boarding schools, school hostels, or board in private homes. Whichever plan is mapped out for your boy, the preparation of a school outfit is necessary and will absorb time and energy, while the same principles will apply to the buying of the various garments, writes Eva Topping, Rural Sociologist, Department of Agriculture, Auckland. Many boys are careless about their clothing at this stage, and they do need to feel comfortable in their clothes and look "like the other fellows," while mothers want good wearing qualities as well as good appearance.



Take the body measurement here with the chest expanded.

LISTS of the required items for boarders are usually included in the prospectus of the selected school hostel, and sometimes the school will advise parents of the stores which stock the regulation uniform garments like blazers, caps, and ties. Shopping nowadays becomes almost a test of endurance, and any preparation or planning that can be done at home will save time and energy for the shopper and salesman alike. Correct size is very important, as clothes of good-fit wear longer, besides giving a neater appearance. Size labels are not an entirely satisfactory guide to fit, as they may vary with different manufacturers and because of the variations in the body build of individuals. It is best to fit jackets, suits, and overcoats on the boy, but for shirts, shorts, and underwear careful measurements may be taken beforehand, on the body or from garments in wear which are a comfortable fit.

Shirts

Shirts can be measured for collar size, sleeve length, and chest measurement. Lay the shirt out flat on a table and measure the inside neck band from the centre of button to outer end of buttonhole if of the buttoned-at-neck type, and from the outer end of each buttonhole if worn with a stud. Measure the sleeve length from under-arm seam to edge of cuff or to the fold of a turned-back cuff. These two measurements should correspond to the neck measurement of the boy taken by putting the inch-tape round the neck at the point where the collar usually rests, and the arm measurement taken from the armpit to wrist. The body measurement just below armpits should be taken when the chest is expanded. Flannel shirts can be an easy fit to allow for shrinkage and growth, since the collar is rarely fastened and the sleeves are usually rolled above the elbow. Loosely-woven flannels tend to shrink more than closer-woven ones. White cotton and other light shirts, whether with attached or detached collars, should be a comfortable fit at the neck; if they are too loose the collar sets badly and gives an untidy appearance. The length of the sleeves is not quite so important as the fit at the neck and across the chest. Sleeves can be lengthened or shortened fairly easily, but any alterations at the neck band and in the width round the body are not generally very satisfactory. White cotton shirts of Beatrice twill give the best wear, but this type is difficult to find these days, and the sturdiest of the substitute materials should be chosen. Most mothers prefer separate collars on these light shirts; the attached collar has two disadvantages, one being that the shirt has to be laundered when the collar is soiled, whereas a clean separate collar would make the shirt wearable again, and the other is that the collar wears out faster than the shirt due to the rubbing in washing.

Shorts

Regulation school shorts are made in various weights of serges, and the choice is a matter of individual preference. Usually the fine-woven, all-wool serges give the best wear. Shorts are sized by measuring at the hip and waist line. These are the important measurements, as the length of leg can always be adjusted. When buying shorts check over these points: put the crutch seams together and see that the back seam is about 2in. to 3in. longer than the front to allow for comfort in sitting and bending; feel down the seams to see what turnings have been left, and reject those shorts which have very narrow allowances, as they pull at the seams too readily and repairs are difficult and unsatisfactory; look at the lining to see if it is made of heavy material containing little dressing and to be sure it fits into the shorts neatly without wrinkling. Pockets should be of heavier material than the lining, as boys' pockets almost always have to withstand hard wear; the seams should be double for extra strength. Look inside to see if a wide piece of the outer garment material has been stitched in, so that no lining will show when the shorts are worn. Stitched bars at the lower edge of the pocket help to prevent tearing at this point. The buttons and buttonholes at the fly need checking; there should be five buttons with the buttonholes worked straight with the grain of the cloth and with stitches of sufficient depth to prevent pulling out or fraying. Five or six belt loops—two in front, one at each side seam, and one or preferably two at the back—prevent ugly gaps between belt and trouser top. If the edges of the loops have not been carefully stitched, frayed ends soon make an appearance after a little wear.

Trousers

Sports and suit trousers need inspection, too, at much the same points. As they are not lined, the amount of seam allowance is easily seen and should not be less than ⅜in. The finish of the seams depends on the material; closely-woven worsteds and serges may not need much finish, but the looser flannels of sports trousers should have over-locked seams. The waist band lining should be cut on the bias for a smooth, neat fit. "Tunnels" are preferable to belt loops on these garments. If the trousers fit well, extra length in the leg is an advantage, as a cuff can be turned up on straight trousers or a tuck can be made behind the existing turn-up. It is an easy matter to take out the tuck or lengthen the turn-up when the trousers become too short. A reinforcement of leather or self material should be stitched inside the turn-up or hem at the back to prevent fraying by the heel of the shoe.

Sports Jackets; Suit Coats

Many of the points which determine a good jacket are not readily seen, for clever pressing can hide defects which become apparent only in wear, if they are not carefully searched for when buying. The lengthwise threads should run straight from the highest point of the shoulders straight down the sleeves when the arm is hanging down naturally. At back and front these threads should run straight from the shoulder to the lower edge of the jacket. Any divergence from the straight towards the neck or armholes indicates poor cutting, and the coat will lose its shape in wear. The fit at armholes should be neat but not too tight; run the hand round the lower edge of the armhole inside the coat when it is on to make sure there is sufficient room for action. If the material is striped, see that the pattern is matched at pocket flaps, where the front edges meet on lapels, and down the back seam. Sports coats are usually only partially lined, with all exposed seams neatly bound. Look at the buttonholes to see that they have been carefully made; eyelet-end ones are more satisfactory and look better than the straight variety.

Know you that Love is armour 'gainst all evil?
Know you that I that armour give to you?
Wear it through storm and wreck and soul's upheaval,
Each shaft it turns will burnish it anew.

Underwear

Woollen singlets are better if made of firmly-knit fabric, as they usually shrink less than the loosely-knit goods. Take the chest measurement and buy accordingly. For woven cotton singlets the same measurement is needed. For underpants take the waist measurement, and now elastic is so little used, make sure that it is big enough to let the garment slip easily over the hip. Reinforcements at the crutch and seat are very desirable. Pyjamas are fortunately not quite so scarce at present. These garments can be bought in larger sizes to allow for growth and slight shrinkage. Take up a large hem at trouser and sleeve ends to adjust length at these points.

Hosiery

Stockings and socks should be roomy, at least ½in. longer than the foot, for tight hosiery can do almost as much harm to the growing foot as tight shoes. Stockings need to be of sturdy knit to withstand hard wear, and those which are knitted in one piece from top to toe wear much better than the ones which have added seamed-on turnovers.

Shoes

It is always as well to buy the best possible quality in shoes and have them carefully fitted for length, width, depth, arch curve, and snug fit at the heel. Some stores have a type of X-ray machine which is very helpful in securing a good fit, as the foot can be seen inside the shoe. Great damage is done to the feet by ill-fitting shoes, and it is poor economy to buy cheap and inferior goods.

Linen

Most schools and some private homes ask the parents to supply sheets, pillow-slips, and table napkins, in addition to towels and personal wear. The bed linen should be of strong materials and the towels capable of standing up to hard wear. Gaily-coloured striped towels, the brighter the better, were popular with boarders, as the individual's towel was quickly recognised, but now that they are hard to find the name should be boldly marked on both ends of plain towels.

The Stitch in Time

Socks and stockings should be darned to reinforce the heels and the wearing points peculiar to the individual.

All buttons can be looked over, and those that are insecurely fastened

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ELSAN CHEMICAL CLOSET

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When marking the strips of calico stretch over a smooth surface.

should be strengthened by more stitching. Buttonholes are sometimes badly finished and are better when worked over again. Pyjama girdles will not pull out if they are firmly stitched across the hem at centre back. Take a look at all the seams and restitch if any turnings were not quite caught in by the machine.

Marking

All garments and toilet articles must be clearly marked with the boy's name. Light shirts, pyjamas, collars, handerchiefs, and underwear can be marked directly on to the material with marking ink. Always put the name in the centre back waistband or back of the neck and on the corners of handkerchiefs. This leaves the name clearly visible when garments are folded in the laundry, and saves much time and trouble for those responsible for sorting, repairing, and storing clothing. Trade-embroidered name tapes are the perfect way of marking clothing, but they have been unprocurable for a long while; perhaps they will soon be on the market again now that factories will be returning to peace-time production. Lengths of linen tape marked in special ink make the next best name tags, but linen tape also has been unobtainable, and even cotton tape has been hard to find. Strips of firm calico, bleached or unbleached, can be used if no tape is available; a strip about 1in. wide should be folded in three lengthwise to turn in raw edges, and creased or pressed down with a hot iron. If a piece of selvedge material is used, make the strip narrower by one turning. To mark, stretch the tape or strip of material tightly over a smooth surface, such as the chopping board, a book, or small tin. Hold firmly by two ends so that the area to be marked is taut. Use a fine nib and do not have too much ink on the pen; make fine strokes, as the ink always spreads a little on the cloth—slightly slanting block letters will be found the easiest to do and are very satisfactory. Let the marking ink dry completely before putting another surface in contact with the name, for either the writing will blur or else a reverse imprint will be found in a place where it is not wanted! Slip a piece of paper under the marking on a sheet, pillowslip, or any folded article so that a stain will not appear on the lower surfaces. It is sometimes difficult to write with marking ink directly on to loosely-woven cotton goods. Try writing on the material with a pencil first and then go over the letters with the special ink; you will find the guide lines helpful and the ink will stay on the blacklead without spreading. The name can be back-stitched in red or blue embroidery cotton on strips of material. This method makes good legible names which will outlast the garment, but it certainly takes a long time to prepare the number usually required for marking an outfit.

Toy Patterns

In the article "Xmas Toys for British Children" in the October issue of the "Journal" "Good Neighbours" desirous of helping in the making of toys were invited to write to Mrs. A. E. Lefeaux, 14 Hay St., Wellington, for patterns. The requests have been so numerous that Mrs. Lefeaux has been unable to keep pace with them. She wishes to apologise to those correspondents who have not had a reply and to thank those who have sent toys, a wonderful array of which has been sent overseas. Though more toys could be sent, no further patterns can be supplied. Disappointed readers are referred to the November issue of the "Journal," in which patterns and constructional guides for simple toys and home-made gifts appear.

All labels, however marked, need firm stitching on to the garments; machine stitching is by far the better method to use, and the extra trouble taken will be offset by less need to restitch after wear and laundering. Stretch the tops of socks and stockings when stitching on the names, or the sewing thread will break when the sock is extended at the ribbing in wear.

Shoes, clothes, and nail and hair brushes also require marking; strips of sticking plaster bearing the name are sometimes used, but invariably come off eventually. Burning the name on with a red-hot skewer makes an indelible mark, but unless the hand is steady and patience unlimited the result is sometimes not very neat. Plain wood will take ordinary ink marks, but a small patch will have to be scraped clear on a brush with a varnished back. Shoes can be marked in ink directly on the lining or on plaster stuck inside.

Make a list of the various garments, brushes, etc., and paste it inside the

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lid of the suitcase or trunk, as it is so much easier to keep track of the possessions if an inventory is easily seen when packing. A smaller case to take away for the shorter holidays and half-term is useful; in fact it is a necessity, for the big trunk really needs to be roomy to hold the complete wardrobe, and would be too unwieldy for most occasions.

Approximate costs for most of the items which go to make up a school outfit and the number of coupons required are given in the list which follows. By multiplying the cost of a single item by the number to be bought, leaving out the garments which the boy already has, an approximate figure for the necessary outlay can be estimated.

Article.	Approximate cost.				Coupons required.
	£	s.	d.		
Shorts		18	9		2
Flannel shirts ..		14	0		2
Stockings ..		4	8	to 6/4	1
Socks		3	10	to 4/6	1
Cotton singlets ..		6	3		2
Woollen singlets ..		10	3	to 11/6	2
Underpants ..		6	5		2
Pyjamas		15	0	upwards	4
Raincoat	3	12	3		8
Blazer	1	14	4		8
White shirts ..		10	3	to 12/9	2
Collars		1	9		1 for 4 collars
Pullovers ..		16	6	to 17/6	3
Belts		2	3		—
Braces		3	9		—
Slippers (leather) ..		19	6		—
Shoes	1	9	11	to 33/6	3
Gym. shoes ..		10	9		2
Handkerchiefs ..		1	5		—
Tie		3	6	to 3/11	—
Cap		5	11		—
Grey flannel trousers	1	17	0		5
Sports jacket ..	3	9	0		8

The garments displayed in the illustrations kindly loaned by Smith and Caughey, Ltd., Auckland. *Photos by Sparrow Industrial Pictures.*

Prayer for Servers

Angels be near them,
Guard them and keep them,
Safe in their danger hour,
Knowing Thy mighty power;
Grant them Thy Peace, Lord,
And Light to know
What Thou wouldst have them do,
Who Thy Way would go.

—E. I. Ashforth.

Table of Contents, December, 1945.

Wasps in New Zealand 561
Fields Division Officers: New Appointments 562
Farming a Small Holding: Mixed Fruit and Dairy Farm in Tauranga District—I. L. Nottage and A. V. Allo 563
Obituary: Mr. C. H. Schwass 570
Radio Broadcasts 570, 607
Farming in New Zealand: Wartime Farming—P. W. Smallfield 571
Beekeeping on the West Coast—A. T. Myers 585
Soil Erosion—J. E. Bell and D. A. Campbell 587
Fat Lamb Production—A. T. Shannon 601
Topdressing in Nelson—D. M. E. Merry 609
Infectious Fowl Paralysis *(Neurolymphomatosis)*—W. G. Fischel 615
Studies in Farm Management: Sharemilking in North Taranaki—A. C. Burgess 621
An Improvised Concrete Mixer—C. Walker 629
Seasonal Notes—Fields Division 631
Book Review 635
The Orchard and Vineyard—Horticulture Division .. 637
Guide for the Home Garden—Horticulture Division .. 641
Apiary Notes—Horticulture Division 644
Poultry-keeping Section—Livestock Division 646
Young Farmers' Clubs—S. Freeman, Editor 648
"The Good Neighbour," by Mary 655

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Sewing Hints

I HAVE three small boys, and it is my pride to see that they are always nicely dressed. Here are a few hints that may be helpful to other mothers. When making bootees do not use ribbons for ties, as they are sure to come off; crochet cords for them, also a medallion or bobble at each end in preference to using tassels of cut wool. A one-piece leggingette suit is a great boon to a baby in winter: it keeps him warm without restricting his movements. For a baby who has reached the crawling stage I knit slippers from oddments of thick wool, using a bootee pattern which starts at the sole. I cast off after the instep shaping and run a cord through the top. These slippers are warm and wear better than felt ones. When making overalls I sew two buttons at the top of the bib and old suspender clips to the straps, instead of making buttonholes which are difficult to do if the cloth is thick. To attach buttons to shirts or pyjamas made of thin material I stick a piece of sticking plaster half an inch square behind the material where the trousers are to be buttoned on, and sew the buttons on there. It saves the buttons tearing out the material.—**"Annette," Westmere.**

SPIN YOUR OWN WOOL.

All stages of the processes of home spinning, from selection of wool to skeining and dyeing, are described in detail in a new bulletin "Spin Your Own Wool." This bulletin, No. 259, also contains a valuable chart for the use of vegetable dyes and mordants. Write for this free bulletin to the Department of Agriculture, Auckland, Wellington, Christchurch, or Dunedin.

The New Zealand Journal of Agriculture

Volume 71, July—December, 1945.

INDEX

A

Abortion, Contagious, Losses Significantly Reduced, 337.
Acetonemia in Cows, 143.
Adamson, N. J., and Rigg, Sir Theodore, Erosion in Moutere Hills Orchards, 495.
Administering Medicines to Livestock, 295.
Agricultural Education and Advisory Work in Britain, 449.
Agricultural Seed, Weed Seeds in, 42, 180, 378, 510.
Alexander, R. E.—
  Rearing Orphan Lambs, 403.
  Some Commoner Lamb Ailments, 403.
  Veterinary Notes, 403.
Allo, A. V., and Nottage, I. L.—Farming a Small Holding: Mixed Fruit and Dairy Farm in Tauranga District, 563.
Apiary Notes (seasonal), 83, 199, 309, 418, 531, 644.
Apple Trees, Hail Damage to, 373.
Attention to Autumn-sown Cereals, 76.

B

Baconers, Carcass Quality in, 243.
Barley Growing in Great Britain, 293.
Barley, Spring Sowing of, 75.
Barrer, P. R.—Studies in Farm Management: Town Milk Supply, 155.
Barry, W. C.—Quarantine, 395.
Bates, E. M.—
  Attention to Autumn-sown Cereals, 76.
  Brassica Crops, 409.
  Cattle Pumpkins, 303.
  Cereal Harvest, 631.
  Cultivation for Autumn-sown Cereals, 634.
  Farm Management, 76.
  Farm Records, 193.
  Field Carrots, 411.
  Grass & Clover: Seed Crops, 521.
  Greenfeed, 632.
  Grow the Crops: Breed the Pigs, 77.
  Hay, 523.
  Irrigation, 525.
  Lucerne, 407.
  Main Crop Potatoes, 302.
  Maize, 300.
  Mangolds and Sugar Beet, 304.
  Pampas Grass, 190.
  Preparation for Hay and Silage, 191.
  Preparations for Maize, 193.
  Preparing Land for Autumn-sown Pasture, 634.
  Seasonal Notes, 75, 189, 299, 407, 521, 631.
  Silage, 299.
  Sowing the Pea Crop, 192.
  Spring Sowing of Pasture, 189.
  Spring Sowing of Wheat, Oats, Barley, 75.
  Weeds an Agricultural Liability, 521.
Bearing Trouble and "Sleepy Sickness" in Ewes, 37.
Beekeeping on the West Coast, 585.
Bees and Orchard Sprays, 414.
Bees, Transport of, 83.
Bee Veil, Handy Type of, 509.
Bell, J. E., and Campbell, D. A.—Soil Erosion, 587.
Bengal, Poultry Keeping in, 513.
Black Pox in Cattle, 297.
Blade Shears, Sharpening, 383.
Blake, G. A.—Growing Canning Peas in Hawke's Bay, 353.
Blood Scours in Calves, 296.
Bluestone for Worm Control, 254.
Boils under Mare's Saddle, 405.
Brassica Crops, 409.
Bray, F. R.—Farming in New Zealand: Land Legislation, 255.
Britain, Agricultural Education and Advisory Work in, 449.
British Farmers and War Effort, 1.
British Farming in Wartime, 127.
Broad, E. G.—Training a Sheep Dog, 451.
Buddle, M. B.—Calfhood Vaccination Recommended, 337.
Building Materials, Developments in, and their Uses, 461.
Burgess, A. C.—Studies in Farm Management: Sharemilking in North Taranaki, 621.
Butter and Cheese, Grading of Export, 476.

C

Cabbage, Comparison of Two Methods of Fertiliser Application to Spring-planted, 375.
Calder, G. G.—Irrigation Practices, 23.
Calfhood Vaccination Recommended, 337.
Calves, Blood Scours in, 296.
Calves, Ringworm in, 72.
Calves, Skim-milk to, through Galvanised Pipe, 73.
Calves, The Dehorning of, 71.
Campbell, D. A., and Bell, J. E.—Soil Erosion, 587.
Canning Peas, Growing, in Hawke's Bay, 353.
Cape Gooseberry Culture, 131.
Carcasses, Disposal of, on the Farm, 295.
Carcass Quality in Baconers, 243.
Carrots, Field, 411.
Castration of Pigs, 71.
Casual Labour Problem? Can Group Employment Solve, 225.
Cattle, Black Pox in, 297.
Cattle Pumpkins, 303.
Cereal Harvest, 631.
Cereals, Attention to Autumn-sown, 76.
Cereals, Cultivation for Autumn-sown, 634.
Cheese and Butter, Grading of Export, 476.
Citrus Notes (seasonal), 305, 413, 527, 640.
Citrus Trees, Reworking of, 67.
Claridge, J. H.—Potato Growing in New Zealand, 135.
Clover and Grass: Seed Crops, 521.
Cocker, L.—Poultry Notes (seasonal), 311.
Cocksfoot Seed Production, 271.
Comparison of Two Methods of Fertiliser Application to Spring-planted Cabbage, 375.
Concrete Mixer, An Improvised, 629.
Contagious Abortion Losses Significantly Reduced, 337.
Corkill, L.—Short-rotation Ryegrass, 465.
Cows, Milk Fever, Staggers, and Acetonemia in, 143.
Cows' Udders, Scabs on, 73.
Cow with Leg Injury, 620.
Cultivation for Autumn-sown Cereals, 634.

D

Dairy Cows with Fractures, 73.
D.D.T.—A New Insecticide, 45.
Dehorning of Calves, The, 71.
Developments in Building Materials and their Uses, 461.
Dick, W. F.—Studies in Farm Management: A Southland Dairy Farm, 223.
Dingwall, A. R., and Hamblyn, C. J.—Earthworms, 55.
Dipping Sheep, New Method of, 341.
Disease Losses in Pigs, Economic Importance of, 147.
Disposal of Carcasses on the Farm, 295.
Dog, Sheep, Training a, 451.
Dog with Throat Trouble, 72.
Dominion Weather Forecasts, 126.
Drills, Hitch for Pulling Two, with One Tractor, 518.
Dumbleton, L. J.—D.D.T.—a New Insecticide, 45.
Duncan, J. E.—
  New Method of Dipping Sheep, 341.
  New Zealand Wool Industry, The, 275.
  Sheep Industry, The, 47.

E

Early Cropping in Nelson, 151.
Earthworms, 55.
Economic Importance of Disease Losses in Pigs, 147.
Elliott, I. L.—Fertilisers, 249.
Erecting a One-man Limeworks, 5.
Erosion in Moutere Hills Orchards, 495.
Erosion, Soil, 587.
Everett, P.—Citrus Notes (seasonal), 305, 413, 527, 640.
Ewes, "Sleepy Sickness" and Bearing Trouble in, 37.

F

Farming a Small Holding: Mixed Fruit and Dairy Farm in Tauranga District, 563.
Farming in New Zealand—
  Farm Home, The, 357.
  Imports, 499.
  Land Development, 11.
  Land Legislation, 255.
  Store and Breeding Stock, 119.
  Wartime Farming, 571.
Farm Management, 76.
Farm Management, Studies in, 59, 155, 233, 349, 477, 621.
Farm Records, 193.
Fat Lamb Production, 601.
Fertiliser Application to Spring-planted Cabbage, Comparison of two Methods of, 375.
Fertilisers, 249.
Field Carrots, 411.
Fields Division Officers: New Appointments, 562.
Findlay, R.—Sharpening Blade Shears, 383.
Fischel, W. G.—Infectious Fowl Paralysis (Neurolymphomatosis), 615.
Foot Trouble in Rams, 296.
Forster, I. W.—Pick-up Hive and Honey Barrow, 269.
Fowl Paralysis, Infectious, 615.
Fractures, Dairy Cows with, 73.

G

Grading of Export Butter and Cheese, 476.
Grainger, A. R.—
  Hail Damage to Apple Trees, 373.
  Orchard Notes (seasonal), 637.
Grass and Clover: Seed Crops, 521.
Grass, Pampas, 471.
Greenfeed, 632.
Greig, A. M. W.—Reworking of Citrus Trees, 67.
Group Employment, 225.
Growing Canning Peas in Hawke's Bay, 353.
Grow the Crops: Breed the Pigs, 77.

H

Haddon, G.—Poultry Keeping in Bengal, 513.
Hadfield, W. V.—Studies in Farm Management: A Pukekohe Small Holding, 477.
Hail Damage to Apple Trees, 373.
Hamblyn, C. J., and Dingwall, A. R.—Earthworms, 55.
Hancock, J. J.—Twin Calf Research at Ruakura, 113.
Handy Type of Bee Veil, 509.
Hay, 523.
Hay and Silage, Preparation for, 191.
Hay Elevator, Home-constructed, 291.
Hill, R. R.—Studies in Farm Management: A Heretaunga Plains Farm, 349.
Hitch for Pulling Two Drills with one Tractor, 518.
Hockey, K. C.—Rejuvenating Pip-fruit Trees, 371.

Hogg, D. J.—Orchard Notes (seasonal), 79, 195, 305, 413, 527.
Holmes, G. A.—
  Agricultural Education and Advisory Work in Britain, 449.
  Barley Growing in Great Britain, 293.
  British Farmers and War Effort, 1.
Home-constructed Hay Elevator, 291.
Home Garden Notes (seasonal), 81, 197, 307, 415, 529, 641.
Hopkirk, Dr. C. S. M.—UNRRA Appointment, 179.
Horse, Non-contagious Skin Diseases of the, 185.
Horses, Lice on, 185.
Horses with Itch, 187.
Hyde, E. O. C.—Weed Seeds in Agricultural Seed, 42, 180, 378, 510.

I

Improvised Concrete Mixer, An, 629.
"Inarching" to Promote Vigour, 371.
Infectious Fowl Paralysis, 615.
Insecticide, D.D.T.—A New, 45.
Interim Sheep Returns, 187.
Irrigation, 525.
Irrigation Practices, 23.
Itch, Horses with, 187.

J

Jeffries, C. R.—Poultry Notes (seasonal), 201, 421.
Jourdain, W. L.—Poultry Notes (seasonal), 420.

K

Kitto, H. A.—Poultry Notes (seasonal), 533.

L

Laing, A. D. G. M.—"Sleepy Sickness" and Bearing Trouble in Ewes, 37.
Lamb Ailments, Some Commoner, 403.
Lambs, Fat, Production of, 601.
Lambs, Rearing Orphan, 403.
Lambs, Tailing and Marking of, 72.
LeSouef, D. H.—Plants Poisonous to Stock, 229.
Lice on Horses, 185.
Limeworks, Erecting a One-man, 5.
Livestock, Administering Medicines to, 295.
Lucerne, 165, 407.

M

McIver, W. L.—Poultry Notes (seasonal), 646.
McPherson, G. K.—Hitch for Pulling Two Drills with One Tractor, 518.
Main Crop Potatoes, 302.
Maize, 300.
Maize, Preparations for, 193.
Mangolds and Sugar Beet, 304.
Mare's Saddle, Boils Under, 405.
Marking and Tailing of Lambs, 72.
Marshall, D.—Milk Fever, Staggers, and Allied Complaints, 143.
Merry, D. M. E.—
  Early Cropping in Nelson, 151.
  Home-constructed Hay Elevator, 291.
  Topdressing in Nelson, 609.
Metson, N.—Farming in New Zealand: The Farm Home, 357.
Milk Fever, Staggers, and Allied Complaints, 143.
More Meat and a Better Pasture, 339.
Moutere Hills Orchards, Erosion in, 495.
Myers, A. J.—
  Beekeeping on the West Coast, 585.
  New Method of Rearing Queen Bees, 21.

N

National Pig Industry Council, 69.
Necrotic Ulcers, Pigs with, 405.
Neurolymphomatosis, 61
New Method of Dipping Sheep, 341.
New Method of Rearing Queen Bees, 21.
N.Z. Agriculturists in Bengal, 179.
N.Z. Poultry Flock Improvement Plan, 183.
New Zealand Wool Industry. The, 275.
Non-contagious Skin Diseases of the Horse, 185.
Nottage, I. L., and Allo, A. V., Farming a Small Holding: Mixed Fruit and Dairy Farm in Tauranga District, 563.

O

Oats, Spring Sowing of, 75.
Obituary: Mr. C. H. Schwass, 570.
Orchard Notes (seasonal), 79, 195, 305, 413, 527, 637.
Orchard Sprays, Bees and, 414.
Origin of Pig Breeds, The, 391.
Owtram, I. H., and Peirson, H. M.—The Origin of Pig Breeds, 391.

P

Pampas Grass, 190, 471.
Paralysis, Infectious Fowl, 615.
Pasture, Preparing Land for Autumn-sown, 634.
Pasture, Spring Sowing of, 189.
Paterson, C. R.—
  Apiary Notes (seasonal), 83.
  Transport of Bees and Equipment, 83.
Pea Crop, Sowing the, 192.
Peas, Growing Canning, in Hawke's Bay, 353.
Peirson, H. M., and Owtram, I. H.—The Origin of Pig Breeds, 391.
Peirson, H. M.—
  Economic Importance of Disease Losses in Pigs, 147.
  Pig Industry in Wartime, 489.
  Pig Management, 147.
Pick-up Hive and Honey Barrow, 269.
Pig Breeds, Origin of, 391.
Pig Industry in Wartime, 489.
Pig Management: Economic Importance of Disease Losses, 147.
Pigs, Castration of, 71.
Pigs, Economic Importance of Disease Losses in, 147.
Pigs, Slaughterings of, 187.
Pigs with Necrotic Ulcers, 405.
Pip-fruit Trees, Rejuvenating, 371.
Plants Poisonous to Stock, 229.
Poaching of Land on Hauraki Plains, 253.
Poisonous Plants, 229.
Potatoes, Main Crop, 302.
Potato Growing in New Zealand, 135.
Poultry Keeping in Bengal, 513.
Poultry Notes (seasonal), 85, 201, 311, 420, 533, 646.
Power-spray System of Dipping Sheep, 341.
Preparation for Hay and Silage, 191.
Preparations for Maize, 193.
Preparing Land for Autumn-sown Pasture, 634.
Pritchard, D. K.—Home Garden Notes (seasonal), 81, 197, 307, 415, 529, 641.
Pumpkins, Cattle, 303.

Q

Quarantine, 395.
Queen Bees, New Method of Rearing, 21.

R

Rams, Foot Trouble in, 296.
Rearing Orphan Lambs, 403.
Rejuvenating Pip-fruit Trees, 371.
Reworking of Citrus Trees, 67.
Rigg, Sir Theodore, and Adamson, N. J.—Erosion in Moutere Hills Orchards, 495.
Ringworm in Calves, 72.
Robinson, G. S.—
  British Farming in Wartime, 127.
  Cocksfoot Seed Production, 271.
Rodda, A. G.—Farming in New Zealand: Imports, 499.
Rodda, T. E.—Comparison of two Methods of Fertiliser Application to Spring-planted Cabbage, 375.
Ruakura, Twin Calf Research at, 113.
Ryegrass, Short-rotation, 465.

S

Scabs on Cows' Udders, 73.
Seasonal Notes, 75, 189, 299, 407, 52, 631.
Seed Crops: Grass and Clover, 521.
Sellwood, T. A.—Studies in Farm Management: A Hakataramea Arable Farm, 59.
Shannon, A. T.—
  Farming in New Zealand: Store and Breeding Stock, 119.
  Fat Lamb Production, 601.
Sharpening Blade Shears, 383.
Shears, Sharpening Blade, 383.
Sheep Dog, Training a, 451.
Sheep Industry, The, 47.
Sheep, New Method of Dipping, 341.
Sheep Returns, Interim, 187.
Short-rotation Ryegrass, 465.
Silage, 299.
Silage and Hay, Preparation for, 191.
Skim-milk to Calves through Galvanised Pipe, 73.
Slaughterings of Pigs, 187.
Slaughterings of Stock, 187, 297.
"Sleepy Sickness" and Bearing Trouble in Ewes, 37.
Smallfield, P. W.—
  Farming in New Zealand: Land Development, 11.
  Wartime Farming, 571.
Small Holding, Farming a: Mixed Fruit and Dairy Farm in Tauranga District, 563.
Smellie, E.—
  Apiary Notes (seasonal), 199, 309, 418, 531, 644.
  Handy Type of Bee Veil, 509.
Smith, D. M.—Carcass Quality in Baconers, 243.
Soil Erosion, 587.
Some Commoner Lamb Ailments, 403.
Some Formulae for Durable Whitewashes, 130.
Sowing the Pea Crop, 192.
Spring Sowing of Pasture, 189.
Spring Sowing of Wheat, Oats, Barley, 75.
Staggers, Milk Fevers, and Acetonemia in Cows, 143.
Stock, Plants Poisonous to, 229.
Stock, Slaughterings of, 187, 297.
Studies in Farm Management—
  A Hakataramea Arable Farm, 59.
  A Heretaunga Plains Farm, 349.
  A Pukekohe Small Holding, 477.
  A Southland Dairy Farm, 233.
  Sharemilking in North Taranaki, 621.
  Town Milk Supply, 155.
Sugar Beet and Mangolds, 304.
Syme, P. S.—
  Developments in Building Materials and their Uses, 461.
  Erecting a One-man Limeworks, 5.
  Group Employment, 225.
  Studies in Farm Management: Town Milk Supply, 155.

T

Tailing and Marking of Lambs, 72.
Throat Trouble, Dog with, 72.
Topdressing in Nelson, 609.
Training a Sheep Dog, 451.
Transport of Bees and Equipment, 83.
Twin Calf Research at Ruakura, 113.

U

Ulcers, Pigs with Necrotic, 405.
UNRRA Appointment: Dr. C. S. M. Hopkirk, 179.

V

Vaccination, Calfhood, Recommended, 337.
Veterinary Notes, 71, 185, 295, 403.

W

Walker, C.—
  An Improvised Concrete Mixer, 629.
  Poaching of Land on Hauraki Plains, 253.
Wasps in New Zealand, 561.
Watt, J. H.—Cape Gooseberry Culture, 131.
Weather Forecast "Districts," Map of, 126.
Weeds an Agricultural Liability, 521.
Weed Seeds in Agricultural Seed, 42, 180, 378, 510.
Wheat, Oats, Barley, Spring Sowing of, 75.
Whitewashes, Some Formulae for, 130.
Women's Section (The Good Neighbour), 93, 207, 321, 429, 541, 655.
Wool Disposal by Joint Organisation, 381.
Wool Industry, The New Zealand, 275.
Worm Control, Bluestone for, 254.

Y

Young Farmers' Clubs Section, 87, 203, 313, 423, 535, 648.

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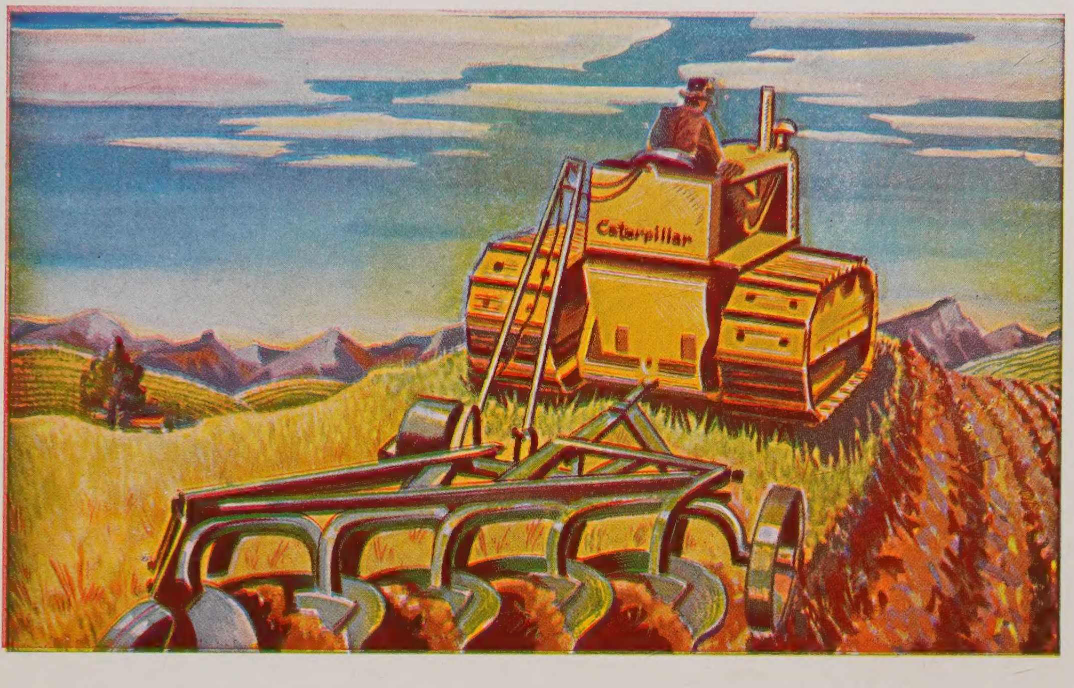

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